

636728

Report Number: 214-TRC-03-009

Safety Compliance Testing For FMVSS 214

Side Impact Protection

Indicant

**Bayerische Motorenwerke AG
2003 BMW 325i 4-door Sedan**

NHTSA Number: C30512

Transportation Research Center Inc.

10820 State Route 347

P. O. Box B-67

East Liberty, OH 43319



Test Date: April 30, 2003

Final Report: May 12, 2003

**U. S. Department Of Transportation
National Highway Traffic Safety Administration
Enforcement**

Office of Vehicle Safety Compliance

400 Seventh Street, S. W.

Room No. 6111 (NVS-220)

Washington, DC 20590

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Test Performed By: Michael S. Postle, Engineering Technician

Report Approved By: _____

Virginia L. Watters
Virginia L. Watters, Project Manager
Transportation Research Center Inc.

Approval Date: _____

May 12, 2003

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J. C. F.

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16. Abstract <p>This 55/28 km/h 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject vehicle, a 2003 BMW 325i 4-door sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-06 (except the test was conducted 8 km/h (5 mph) faster than the standard specified) to determine FMVSS 214 Side Impact Protection compliance. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on April 30, 2003.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck (driver's side) side of the target vehicle at the time of impact was 21° C. The target vehicle's post-test maximum crush was 343 mm at Level 2.</p> <p>The test or target vehicle's performance is given below:</p> <table border="1"> <thead> <tr> <th></th> <th>Front SID-H3</th> <th></th> <th>Rear SID-H3</th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td>58.8</td> <td>g's</td> <td>49.7</td> <td>g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td>51.5</td> <td>g's</td> <td>52.3</td> <td>g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td>94.4</td> <td>g's</td> <td>47.6</td> <td>g's</td> </tr> <tr> <td>Thoracic Trauma Index, (TTI):</td> <td>76.6</td> <td>g's</td> <td>50.0</td> <td>g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td>130.3</td> <td>g's</td> <td>55.9</td> <td>g's</td> </tr> </tbody> </table> <p>The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.</p>				Front SID-H3		Rear SID-H3		Left Upper Rib Acceleration:	58.8	g's	49.7	g's	Left Lower Rib Acceleration:	51.5	g's	52.3	g's	Lower Spine Acceleration:	94.4	g's	47.6	g's	Thoracic Trauma Index, (TTI):	76.6	g's	50.0	g's	Pelvis Acceleration (PEV):	130.3	g's	55.9	g's
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Table of Contents

<u>Section</u>	<u>Description</u>	<u>Page No.</u>
1	Purpose and Test Procedure	1-1
2	Summary of Side Impact Test	2-1
3	Summary of Test Results	3-1
	Data Sheet 1 - General Vehicle Test Parameter Data	3-2
	Data Sheet 2 - Test Vehicle Summary of Results	3-5
	Data Sheet 3 - Moving Deformable Barrier (MDB) Summary	3-6
	Data Sheet 4 - Post-Test Observations	3-7
4	Occupant and Vehicle Information	4-1
	Data Sheet 5 - SID Instrumentation Data	4-2
	Data Sheet 6 - Vehicle Pre-Test And Post-Test Measurements	4-4
	Data Sheet 7 - SID Longitudinal Clearance Dimensions	4-5
	Data Sheet 8 - SID Lateral Clearance Dimensions	4-6
	Data Sheet 9 - Vehicle Side Measurements	4-7
	Data Sheet 10 - Vehicle Exterior Crush Profiles - All Levels	4-8
	Data Sheet 11 - Vehicle Damage Profile Distances	4-10
	Data Sheet 12 - Exterior Static Crush For Impactor Face	4-11
	Data Sheet 13 - Test Vehicle Accelerometer Locations and Data Summary	4-21
	Data Sheet 14 - MDB Accelerometer Locations and Data Summary	4-25
	Data Sheet 15 - High-Speed Camera Locations and Data	4-26
5	Vehicle Fuel System Integrity	5-1
	Data Sheet 16 - FMVSS 301 Fuel System Integrity Data	5-2
	Data Sheet 17 - FMVSS 301 Rollover Data	5-3
Appendix A	Photographs	A-1
Appendix B	Data Plots	B-1
Appendix C	Sid Configuration and Performance Verification Data	C-1
Appendix D	Test Equipment List and Calibration Information	D-1

Section 1

Purpose and Test Procedure

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-11114. The purpose of this test was to evaluate side impact protection in a 2003 BMW 325i 4-door sedan. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (IP-214D-06, dated July 2001) with the exception of test speed, which was at the NCAP High-Speed Lateral Impact level (61.2 km/h).

Section 2

Summary of Side Impact Test

A 2003 BMW 325i 4-door sedan was impacted on the driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.1 km/h (38.6 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on April 30, 2003. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact Hybrid III dummies (SID-H3s) are included in Appendix A.

Two restrained Side Impact Hybrid III Dummies (SID-H3s) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (IP-214D-06, dated July 2001). Both SID-H3s were certified prior to this test. The side impact test was documented by one real-time camera and 6 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID-H3s were instrumented with the following accelerometers:

1. Head (HED) triaxial and redundant accelerometers (X, Y, and Z-directions)
2. Neck (NEK) triaxial force and moment load cells (X, Y, and Z-directions)
3. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
4. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
5. Lower Thoracic Spine (T₁₂) uniaxial and redundant accelerometer (Y-direction)
6. Pelvic (PFV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact Hybrid III dummy (SID-H3) configuration and verification test data can be found in Appendix C. A total of 68 channels of data were recorded. Appendix B contains the vehicle, MDB, and dummy response data traces.

The following tables summarize the results of the test:

Injury Criteria	Front SID-H3	Rear SID-H3
THI (g)	76.6	50.0
PEV (g)	130.3	55.9

Head Injury Criteria (HIC)

Injury Criteria	Front SID-H3	Rear SID-H3
HIC	324	312
t_1 (ms)	25.4	57.0
t_2 (ms)	58.3	64.4
Average Acceleration $t_1 - t_2$ (g)	39.5	70.3

HIC is as defined in FMVSS 208. The maximum time interval t_1 to t_2 is 36 ms.

Neck Injury Criteria

Maximum Values	Front SID-H3	Rear SID-H3
Neck X-axis Force (N)	-293	857
Neck Y-axis Force (N)	-550	-649
Neck Z-axis Force (N)	-1160	-1400
Moment About X-axis (Nm) ¹	-103.1	-83.5
Moment About Y-axis (Nm)	-32.9	-63.0
Moment About Z-axis (Nm)	-21.6	-21.3

¹ Calculated about the occipital condyle with the following formula: $M_{occ} = M_x + 0.01778F_y$.

Data Acquisition Explanations

The vehicle's left side sill at the front seat Y-axis acceleration channel, LFSYG1, recorded questionable data throughout the test. The vehicle's calculated left side sill at the front seat Y-axis velocity and displacement were also affected.

The vehicle's right side sill at the front seat Y-axis acceleration channel, RFSYG1, exceeded full scale at approximately 48 ms and recorded no useful data after that. The vehicle's calculated right side sill at the front seat Y-axis velocity and resultant acceleration were also affected.

The vehicle's left front seat track Y-axis acceleration channel, LFTYG1, recorded questionable data throughout the test and did not return to zero. The vehicle's calculated left front seat track Y-axis velocity was also affected.

Section 3

Summary of Test Results

Data Sheet 1

General Test Vehicle Parameter Data

Test Vehicle Information:

Vehicle Year/Make/Model: 2003 BMW 325i
Vehicle Body Style/Color: 4-door sedan/White VIN: WBAET37493NJ26109
Vehicle NHTSA No.: C30512 Build Date: 11/02
Engine Data: 6 Cylinders; CID; 2.5 Liters; cc
Placement: X Longitudinal; or - Lateral; or - Horizontal
Transmission: 5 Speed; - Manual; X Automatic; - Overdrive
Final Drive: - RWD; X FWD; - Four-Wheel Drive
Odometer Reading: 151 km
Options: X A/C; X Power steering; X Pwr. brakes; X Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity)* 240 kPa Front; 290 kPa Rear
Recommended Tire Size: 205/55R16
Tires on Test Vehicle: 205/55R16 Manufacturer: Continental Contitouring
Contact

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; - 3rd seat; 5 Total
Type of Front Seats: X Bucket; - Bench; - Split bench
Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob
Vehicle Max. Capacity Loading = 480 kg (A)
No. of Occupants x 68.04 kg. = 340 kg (B)
Vehicle Cargo Capacity (A-B) = 140 kg

Test Vehicle Delivered Weight with Maximum Fluids:

Left Front	=	<u>373.0</u> kg	Left Rear	=	<u>371.0</u> kg
Right Front	=	<u>382.5</u> kg	Right Rear	=	<u>380.5</u> kg
Total Front	=	<u>755.5</u> kg	Total Rear	=	<u>751.5</u> kg
Front % of Total Weight	=	<u>50.1</u> %	Rear % of Total Weight	=	<u>49.9</u> %
Total Weight	=	<u>1507.0</u> kg			

* Tire pressure used in test.

Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Calculation Of Vehicle's Target Test Weight:

Total Test Vehicle Delivered Weight with Max. Fluids = 1507 kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle = 140 kg (B)
Weight of Instrumented Side Impact Dummies (2 X 84.0 kg) = 168 kg (C)
Test Vehicle Target Weight: = 1815 kg (A+B-C)

Fully Loaded Test Vehicle (UDW - 2 SIDs - Cargo):

Left Front	=	<u>410.5</u> kg	Left Rear	=	<u>525.0</u> kg
Right Front	=	<u>375.0</u> kg	Right Rear	=	<u>504.5</u> kg
Total Front	=	<u>785.5</u> kg	Total Rear	=	<u>1029.5</u> kg
Front % of Total Weight	=	<u>43.3</u> %	Rear % of Total Weight	=	<u>56.7</u> %
Total Weight	=	<u>1815.0</u> kg			

As Tested Weight of Test Vehicle (2 SIDs + Cargo + Equipment & Instrumentation):

Left Front	=	<u>415.2</u> kg	Left Rear	=	<u>474.0</u> kg
Right Front	=	<u>428.4</u> kg	Right Rear	=	<u>491.8</u> kg
Total Front	=	<u>843.6</u> kg	Total Rear	=	<u>965.8</u> kg
Front % of Total Weight	=	<u>46.6</u> %	Rear % of Total Weight	=	<u>53.4</u> %
Total Weight	=	<u>1809.4</u> kg			

Test Vehicle Attitude (all dimensions in millimeters):

As Delivered	Fully Loaded	Ready For Test
Right Front <u>700</u>	Right Front <u>686</u>	Right Front <u>683</u>
Left Front <u>698</u>	Left Front <u>675</u>	Left Front <u>683</u>
Right Rear <u>665</u>	Right Rear <u>607</u>	Right Rear <u>627</u>
Left Rear <u>670</u>	Left Rear <u>603</u>	Left Rear <u>621</u>

Test Vehicle Wheelbase: 2728 mm

C.G. = 1457 mm rearward of front wheel centerline

Total Vehicle Length:

Right Side = 4260 mm
Left Side = 4260 mm
Centerline = 4480 mm

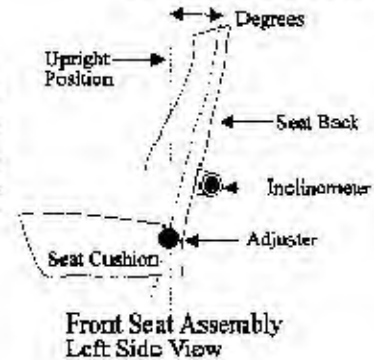
Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Front Seat Cushion Placement: 19th detent rearward
counting full forward detent as number 1.

Total Length of Fore/Aft Adjustment Travel: 227 mm

Total Number of Adjustment Positions or Detents: 36

Front Seat Back Adjustment Position: The back was adjusted to 17.0° measured along head restraint bars.

Seat Back Torso Angle: 17 degrees

Second Position Seat Placement: Fixed

Total Length of Fore/Aft Adjustment Travel: N/A mm

Seat Back Adjustment Position: N/A, not adjustable

Adjustable Steering Column Position: 23.5°; steering wheel hub is at geometric center of its adjustment range (20.0°-25.0°)

Telescoping Steering Column Position: 90 mm; steering column is at geometric center of its adjustment range.

Window Positions:

Right Front: Open

Right Rear: Open

Left Front: Closed

Left Rear: Closed

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent in Fuel Tank:

62.8 liters (fuel tank usable capacity)

58.3 liters used in test (92% - 94% of fuel tank usable capacity)

Location of Impact Point on Test Vehicle Side To Be Impacted:

Wheelbase = 2728 millimeters

Intended impact point is 940 millimeters forward of the wheelbase midpoint

Actual Impact Point is 426 millimeters rearward of front axle centerline

Data Sheet 2

Test Vehicle Summary of Results

Vehicle Year/Make/Model: 2003/BMW/325i

Body Style: 4-door sedan

VIN: WBAET37493NJ26109

NHTSA No.: C30512

Build Date: 11/02

Test Date: 04/30/03

Vehicle Overall Length = 4480 mm

Overall Width = 1728 mm

Vehicle Test Weight (Pre-Test):

Left Front	=	<u>415.2</u>	kg	Left Rear	=	<u>474.0</u>	kg
Right Front	=	<u>428.4</u>	kg	Right Rear	=	<u>491.8</u>	kg
Total Front	=	<u>843.6</u>	kg	Total Rear	=	<u>965.8</u>	kg
Total Weight	=	<u>1809.4</u>	kg				
Wheelbase	=	<u>2728</u>	mm				

Longitudinal C.G. From Center Of Front Axle = 1457 mm

Impact Angle With Respect To Impactor = 90 degrees

Impact Point:

Actual Impact Point is 2 mm Right of nominal impact ref. line (Lateral)

Actual Impact Point is 8 mm Up from nominal impact point (Vertical)

Maximum Exterior Static Crush:

1. Level 1 (	<u>234</u>	mm above ground) =	<u>59</u>	mm
2. Level 2 (	<u>480</u>	mm above ground) =	<u>343</u>	mm
3. Level 3 (	<u>645</u>	mm above ground) =	<u>331</u>	mm
4. Level 4 (	<u>868</u>	mm above ground) =	<u>305</u>	mm
5. Level 5 (	<u>1360</u>	mm above ground) =	<u>84</u>	mm

Maximum Post-Test Intrusion = 343 mm

Occupants:

Front Passenger

Rear Passenger

Dummy Identification 028

065

Restraints Used Seat belt, head protection
system, side torso airbag

Seat belt

Instrumentation:

Number of Vehicle Data Channels: = 21

Number of Cameras: Onboard = 3 Offboard = 8 Total = 11

Data Sheet 3

Moving Deformable Barrier(MDB) Summary

MDB Face Manufacturer and Serial Number:

Plascore, 018A0303-2/013C0203

Position Of Impactor (MDB) On Monorail:

Crabbed 27°

MDB Specifications:

Overall Width of Framework Carriage	=	<u>1251</u>	mm
Overall Length of MDB (Incl. honeycomb impact face)	=	<u>4014</u>	mm
Wheelbase of Framework Carriage	=	<u>2591</u>	mm
Track of Framework Carriage (Front & Rear)	=	<u>1881</u>	mm
C.G. Location Rearward of Front Axle	=	<u>1117</u>	mm

MDB Weight:

Left Front	=	<u>383.6</u>	kg	Left Rear	=	<u>299.4</u>	kg
Right Front	=	<u>390.6</u>	kg	Right Rear	=	<u>286.8</u>	kg
Total Front	=	<u>774.2</u>	kg	Total Rear	=	<u>586.2</u>	kg
Total MDB Weight	=	<u>1360.4</u>	kg				
Impact Angle (MDB C/L to Target Vehicle C/L)	=	<u>90</u>	degrees				
Impact Speed	=	<u>62.1</u>	km/h				

Maximum Static Crush of Honeycomb Impact Face:

1. Row A at Center of Bumper Level	=	<u>172</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>90</u>	millimeters
3. Row C at Mid Level	=	<u>149</u>	millimeters
4. Row D at Top of Stack Level	=	<u>180</u>	millimeters

Instrumentation:

Number of MDB Data Channels = 5

Data Sheet 4

Post-Test Observations

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Visible Dummy Contact Points:

	<u>Left Front SID-H3</u>	<u>Left Rear SID-H3</u>
Head:	<u>Head protection system</u> <u>passenger seat head restraint</u>	<u>C-pillar/side header, head</u> <u>restraint</u>
Upper Torso:	<u>Side airbag, door panel,</u> <u>B-pillar</u>	<u>Door panel</u>
Lower Torso:	<u>Door panel</u>	<u>Door panel</u>
Left Knee:	<u>Door panel</u>	<u>Door panel</u>
Right Knee:	<u>None</u>	<u>None</u>

Door Opening:

	<u>Left Side</u>	<u>Right Side</u>
Front:	<u>Jammed and latched</u>	<u>Easy</u>
Rear:	<u>Jammed and latched</u>	<u>Easy</u>

MDB Distance From Target Impact Point:

Vertical: 8 mm up from target

Horizontal: 2 mm right from target

Arm Rest Locations:

Front:	<u>241 mm below the bottom of the window</u>
Rear:	<u>273 mm below the bottom of the window</u>

Seat Movement:

Front:	<u>None</u>
Rear:	<u>None (fixed seat)</u>

Glazing Damage:

Windshield:	<u>Broken along driver A-pillar</u>
Window:	<u>Driver and passenger side windows broken.</u>

Pillar Separation: No

Sill Separation: No

Other Notable Impact Effects:

None

Section 4

Occupant and Vehicle Information

Data Sheet 5

SID-H3 Instrumentation Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

TEST NUMBER: 030430

DRIVER DUMMY SERIAL NUMBER: 028

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	9.2 g	@ 136.3 ms	18.9 g	@ 48.2 ms
LATERAL	51.0 g	@ 40.8 ms	17.7 g	@ 141.3 ms
VERTICAL	28.1 g	@ 26.2 ms	18.3 g	@ 36.3 ms
RESULTANT	53.7 g	@ 42.3 ms		
HIC	324 from 25.4 to 58.3 ms			

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	9.2 g	@ 135.9 ms	18.6 g	@ 48.0 ms
LATERAL	51.8 g	@ 41.6 ms	17.6 g	@ 141.8 ms
VERTICAL	26.2 g	@ 26.2 ms	18.1 g	@ 36.4 ms
RESULTANT	54.1 g	@ 41.6 ms		
HIC	326 from 25.4 to 58.2 ms			

NECK FORCE

X-AXIS SHEAR	94.6 N	@ 142.8 ms	292.9 N	@ 60.6 ms
Y-AXIS SHEAR	245.2 N	@ 40.8 ms	549.6 N	@ 29.6 ms
Z-AXIS AXIAL	960.3 N	@ 124.2 ms	1160.4 N	@ 37.8 ms

NECK MOMENT

ABOUT X-AXIS	27.6 N-m	@ 25.4 ms	106.2 N-m	@ 39.4 ms
ABOUT Y-AXIS	28.8 N-m	@ 77.2 ms	32.9 N-m	@ 47.8 ms
ABOUT Z-AXIS	10.5 N-m	@ 65.8 ms	21.6 N-m	@ 161.8 ms
OCCIPITAL COND	25.6 N-m	@ 84.8 ms	103.1 N-m	@ 39.2 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	58.8 g	@ 20.0 ms	10.7 g	@ 96.3 ms
LATERAL (R)	61.3 g	@ 20.0 ms	10.4 g	@ 96.3 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	51.5 g	@ 28.7 ms	15.2 g	@ 66.3 ms
LATERAL (R)	54.4 g	@ 20.0 ms	15.2 g	@ 66.9 ms
TTI d (P)	76.6			
TTI d (R)	78.1			

LOWER SPINE ACCELERATION

LATERAL (P)	94.4 g	@ 25.6 ms	18.5 g	@ 60.6 ms
LATERAL (R)	94.9 g	@ 25.6 ms	18.1 g	@ 56.3 ms

PELVIS ACCELERATION

LATERAL (P)	130.3 g	@ 23.1 ms	15.9 g	@ 48.1 ms
LATERAL (R)	130.8 g	@ 23.1 ms	16.0 g	@ 48.1 ms

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 5 (Continued)

SID-II₃ Instrumentation Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

TEST NUMBER: 030430

PASSENGER DUMMY SERIAL NUMBER: 065

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	6.6 g	@ 72.6 ms	22.3 g	@ 83.7 ms
LATERAL	100.6 g	@ 60.2 ms	39.2 g	@ 243.8 ms
VERTICAL	14.5 g	@ 59.9 ms	23.6 g	@ 73.3 ms
RESULTANT	101.4 g	@ 60.2 ms		
HIC	312 from 57.0 to 64.4 ms			

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	7.0 g	@ 72.8 ms	22.0 g	@ 83.5 ms
LATERAL	102.2 g	@ 60.2 ms	39.2 g	@ 243.7 ms
VERTICAL	14.8 g	@ 59.9 ms	23.5 g	@ 73.6 ms
RESULTANT	103.1 g	@ 60.2 ms		
HIC	329 from 57.0 to 64.5 ms			

NECK FORCE

X-AXIS SHEAR	857.3 N	@ 98.7 ms	140.9 N	@ 295.6 ms
Y-AXIS SHEAR	103.5 N	@ 246.9 ms	648.7 N	@ 96.9 ms
Z-AXIS AXIAL	534.5 N	@ 245.0 ms	1400.2 N	@ 63.0 ms

NECK MOMENT

ABOUT X-AXIS	15.1 N-m	@ 153.5 ms	78.6 N-m	@ 74.6 ms
ABOUT Y-AXIS	17.1 N-m	@ 106.4 ms	63.0 N-m	@ 81.8 ms
ABOUT Z-AXIS	21.2 N-m	@ 88.7 ms	21.3 N-m	@ 273.0 ms
OCCIPITAL COND	16.2 N-m	@ 168.9 ms	83.5 N-m	@ 74.6 ms

LEFT UPPER RIB ACCELERATION

LATERAL (P)	49.7 g	@ 55.6 ms	5.1 g	@ 261.3 ms
LATERAL (R)	48.8 g	@ 55.6 ms	5.1 g	@ 261.3 ms

LEFT LOWER RIB ACCELERATION

LATERAL (P)	52.3 g	@ 56.3 ms	3.8 g	@ 108.1 ms
LATERAL (R)	52.1 g	@ 56.3 ms	4.1 g	@ 102.5 ms
TTI d (P)	50.0			
TTI d (R)	49.5			

LOWER SPINE ACCELERATION

LATERAL (P)	47.6 g	@ 61.2 ms	4.3 g	@ 106.9 ms
LATERAL (R)	46.8 g	@ 61.2 ms	4.4 g	@ 87.5 ms

PELVIS ACCELERATION

LATERAL (P)	55.9 g	@ 47.5 ms	5.7 g	@ 78.1 ms
LATERAL (R)	56.1 g	@ 47.5 ms	5.7 g	@ 78.1 ms

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

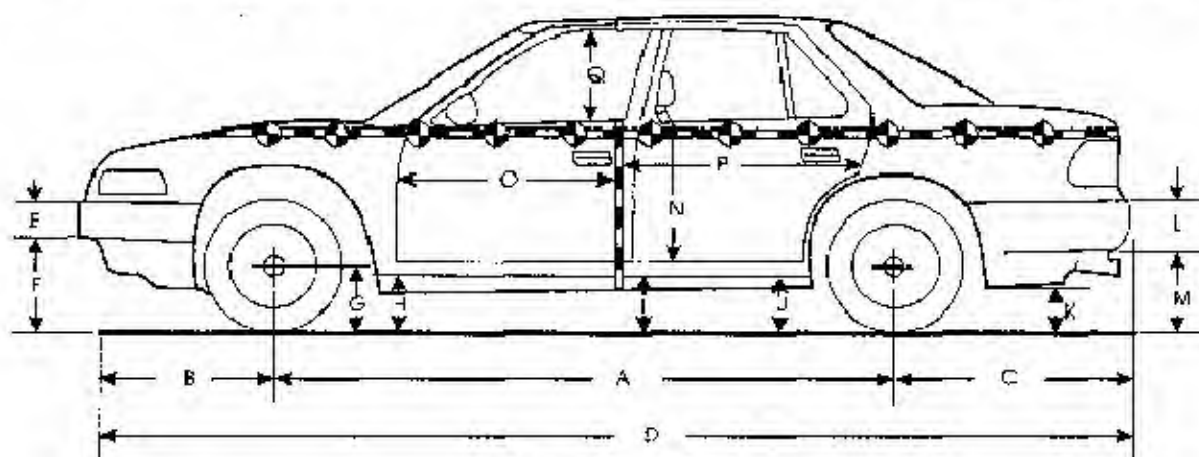
LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 6

Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2003 BMW 325i 4-door sedan

NIITSA No.: C30512



Left Side View

Note: All dimensions are in millimeters with tolerance of ± 3 mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2728	2728	2682	46
B	750	750	750	0
C	990	990	990	0
D	4480	4480	4480	0
E	190	190	190	0
F	325	313	351	-38
G	302	300	300	0
H	230	210	112	98
I	243	213	205	8
J1	185	155	177	-22
J2	132	201	221	-20
K	257	218	235	-17
L	290	290	290	0
M	342	294	310	-16
N	630	630	566	64
O	643	643	624	19
P	1357	1357	1255	102
Q	425	425	415	10
R	4260	4260	4276	-16
S	4260	4260	4195	65
T	1325	1325	1100	225

D = Length at centerline
T = Width at B-pillar

F&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

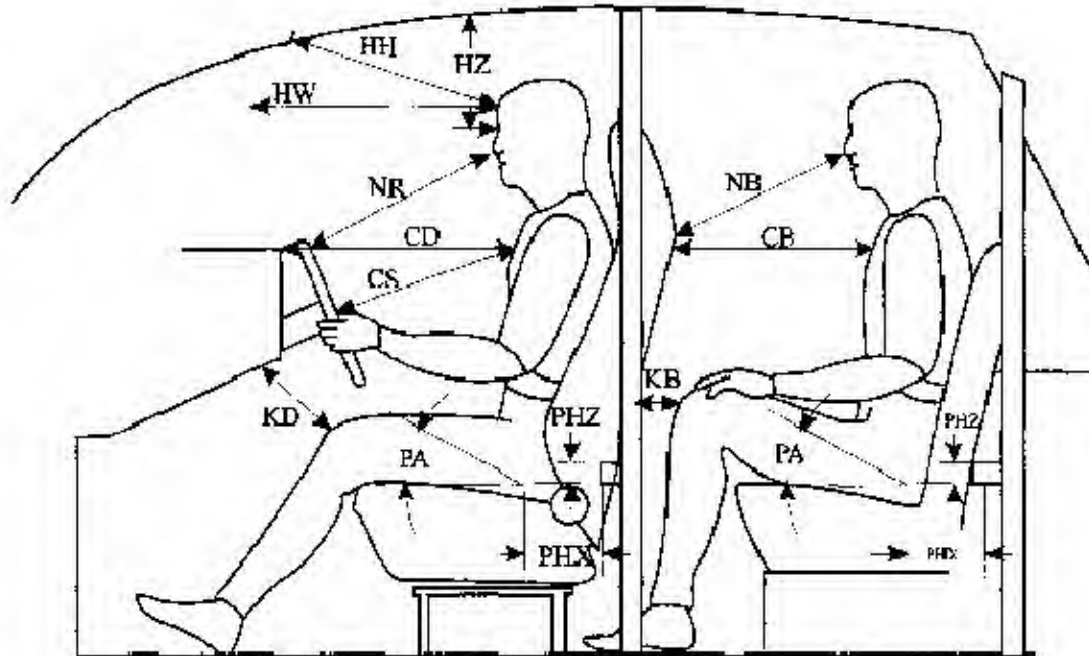
S = Left Side Length

Data Sheet 7

SID-H3 Longitudinal Clearance Dimensions

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



Left Side View

Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID-H3 # 028	Left Rear Pass. SID-H3 # 065
HH	439	N/A
HW	645	N/A
HZ	160	147
NR/NB	481	610
CD/CB	562	488
CS	368	N/A
KDI/(KDA°)/KBL/(KBA°)	154/(56.0°)	80/(66.6°)
KDR/(KDA°)/KBR/(KBA°)	138/(46.8°)	85/(72.2°)
PA°	24.3°	24.8°
PHX	143	N/A ¹
PHZ	284	266

Note: Rear dummy PHX and PHZ measurements for 4-door sedan vehicle use the C-post striker as a reference point.

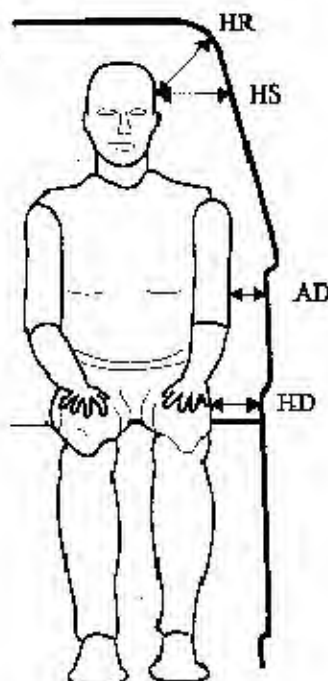
¹ The passenger H-point longitudinal measurement was within the specified window, but was not recorded.

Data Sheet 8

SID-H3 Lateral Clearance Dimensions

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID-113 # 028	Left Rear Pass. SID-H3 # 065
HR	180	220
HS	292	345
AD*	Lower: 98 Upper: 100	Lower: 168 Upper: 159
HD	153	221

* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID arm segment to the closest part of the vehicle side.

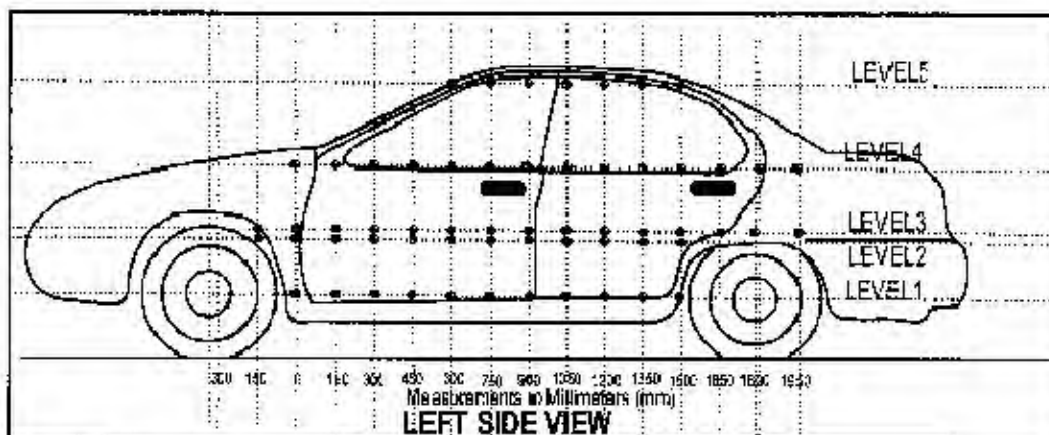
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID arm segment to the closest part of the vehicle side.

Data Sheet 9

Vehicle Side Measurements

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



Level 5 - Window Top

Level 4 - Window Sill

Level 3 - Mid-Door

Level 2 - Occupant H-Point

Level 1 - Axle Centerline Height or Sill Top Height

Measurements Are Taken When The Vehicle Is In The "As Tested" Configuration.

Measurements along the vertical 750 mm line shown above:

Level 5 @ Window Top	=	<u>1360</u>	mm
Level 4 @ Window Sill	=	<u>868</u>	mm
Level 3 @ Mid Door	=	<u>645</u>	mm
Level 2 @ Occupant H-Point	=	<u>480</u>	mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>234</u>	mm

Data Sheet 10

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

		(mm) From Impact Point														
Location	Height	-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	
Level 1 Side Sill	Pre	---	---	740	---	---	---	---	---	685	678	673	662	664	662	
	Post	---	---	740	---	---	---	---	---	687	707	719	721	721	716	
	Crush	---	---	0	---	---	---	---	---	2	29	46	59	57	54	
Level 2 H-Point	Pre	---	---	701	---	---	---	---	---	662	656	652	640	641	640	
	Post	---	---	695	---	---	---	---	---	759	865	907	940	957	948	
	Crush	---	---	-6	---	---	---	---	---	97	209	255	300	316	308	
Level 3 Mid-Door	Pre	---	---	---	708	645	---	---	655	659	655	650	638	637	634	
	Post	---	---	---	708	660	---	---	706	752	826	854	889	916	940	
	Crush	---	---	---	0	15	---	---	51	93	171	204	251	279	306	
Level 4 Window Sill	Pre	---	---	---	---	---	---	745	732	720	705	702	695	680	678	
	Post	---	---	---	---	---	---	765	755	755	762	794	830	875	908	
	Crush	---	---	---	---	---	---	20	23	35	57	92	135	195	230	
Level 5 Window Top	Pre	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Post	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
	Crush	---	---	---	---	---	---	---	---	---	---	---	---	---	---	

Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Location	Height	(mm) From Impact Point														
		900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700		
Level 1 Side Sill	Pre	660	665	670	668	670	676	677	---	---	---	---	---	---		
	Post	711	708	702	698	692	684	670	---	---	---	---	---	---		
	Crush	51	43	32	30	22	8	-7	---	---	---	---	---	---		
Level 2 H-Point	Pre	642	642	640	638	642	647	648	643	---	---	---	---	670		
	Post	957	982	983	900	957	922	867	695	---	---	---	---	---		
	Crush	315	340	343	262	315	275	219	52	---	---	---	---	---		
Level 3 Mid-Door	Pre	635	638	635	637	638	642	644	648	634	---	---	652	695		
	Post	931	935	946	956	955	960	926	805	680	---	---	983	710		
	Crush	296	297	311	319	317	318	282	157	46	---	---	331	15		
Level 4 Window Sill	Pre	678	670	670	673	673	675	676	665	663	700	708	718	735		
	Post	925	931	929	947	977	980	920	810	707	742	741	746	754		
	Crush	247	261	259	274	304	305	244	145	44	42	33	28	19		
Level 5 Window Top	Pre	958	945	942	942	940	943	948	951	970	---	---	---	---		
	Post	1015	1005	1010	1026	1015	1009	1000	1000	1001	---	---	---	---		
	Crush	57	60	68	84	75	66	52	49	31	---	---	---	---		

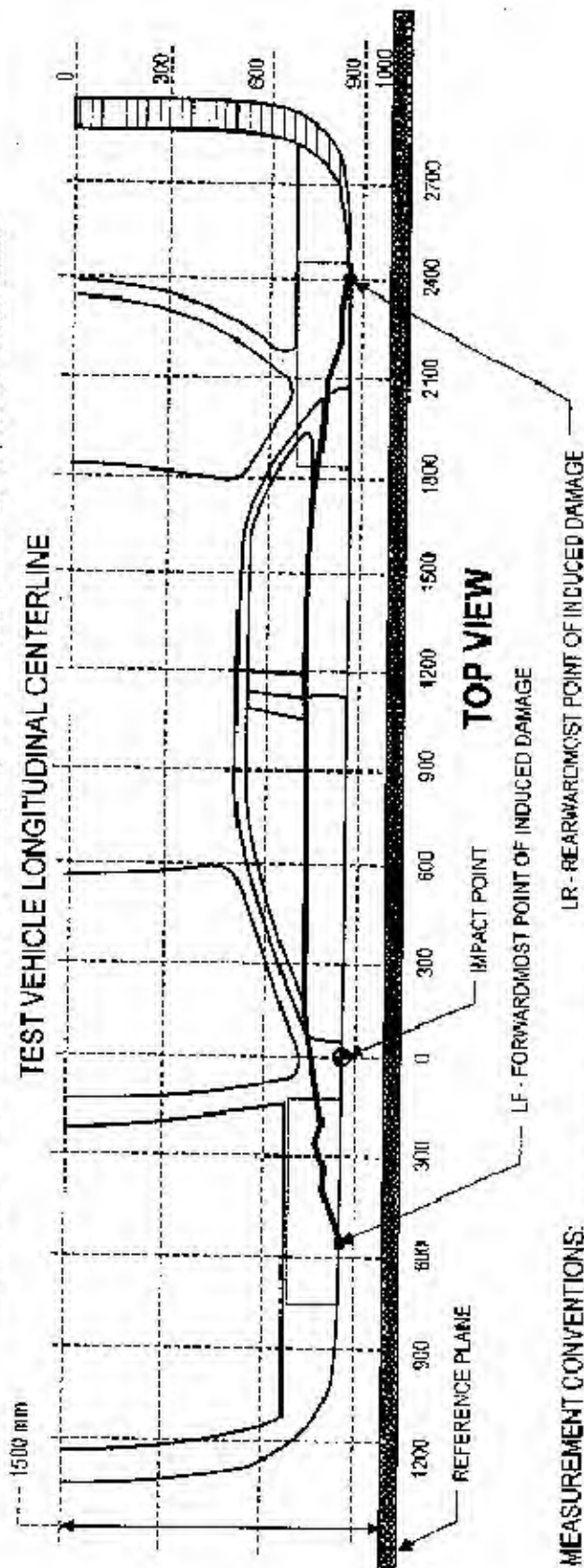
Data Sheet 11

Vehicle Damage Profile Distances

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

NOTE: All measurements are in millimeters (mm) and should be accurate to plus or minus 3mm.



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-)

Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

DPD Measurements	Post-Test (mm)	Pre-Test (mm)	Static Crush (mm)
6: LF = -150 mm (Level 3)	706	655	51
5: 300 mm (Level 2)	907	652	255
4: 750 mm (Level 2)	948	640	308
3: 1200 mm (Level 2)	983	640	343
2: 1650 mm (Level 3)	960	642	318
1: LR = 2100 mm (Level 3)	680	634	46

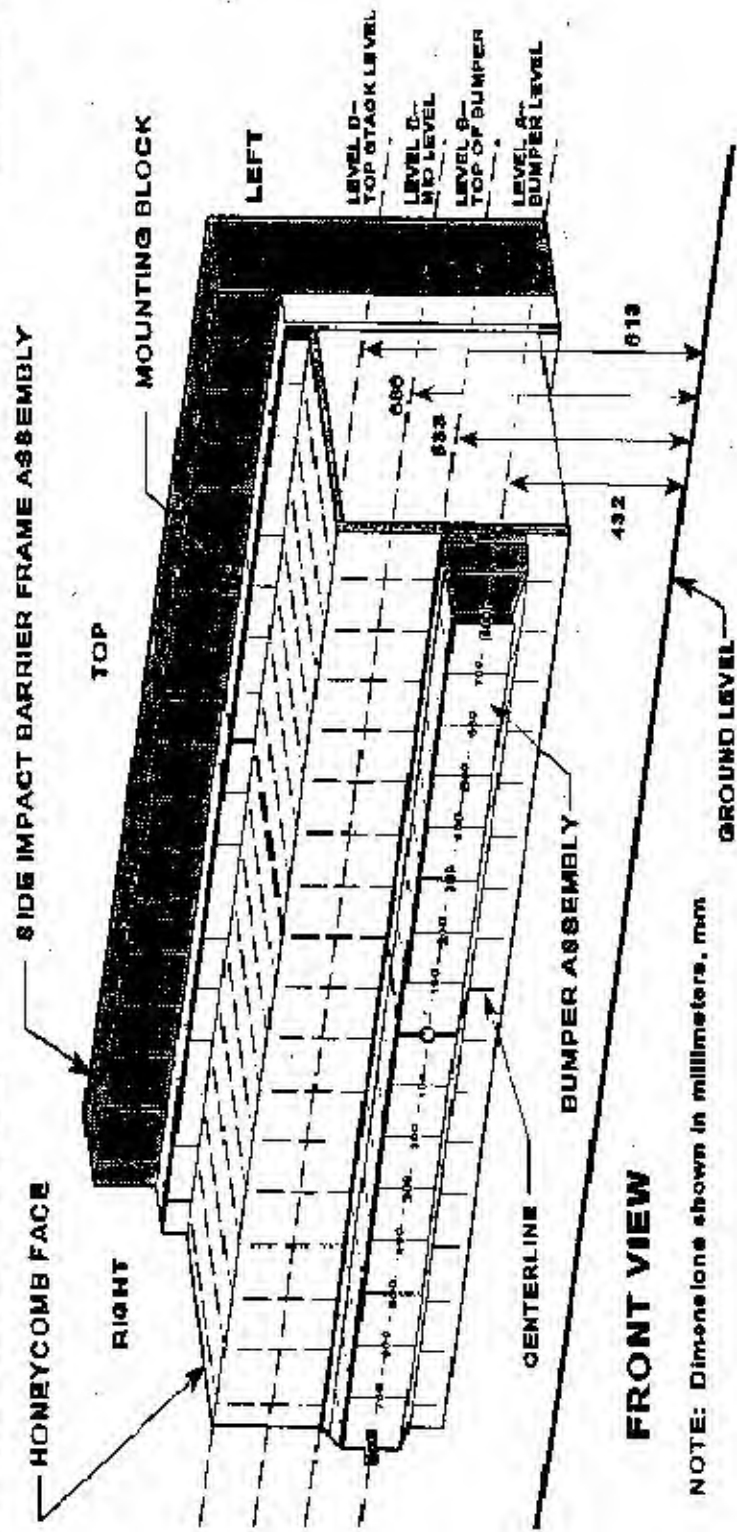
Data Sheet 12

Exterior Static Crush For Impactor Face

(Grid as looking at MDB from front)

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



FRONT VIEW

NOTE: Dimensions shown in millimeters, mm

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

		Distance Right of Center (mm)									Distance Left of Center (mm)								
	Height At CL	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800	
Top Stack Level - Level D	813	-66	-19	-6	-9	-26	-44	-31	-24	-28	-34	-44	-56	-74	-102	-135	-159	-180	
Mid Level Level C	684	-59	-19	-11	-12	-19	-36	23.9	-18	-14	-15	-17	-22	-35	-55	-87	-130	-149	
Top Bumper Level - Level B	559	-90	-74	-65	-50	-41	-42	-39	-42	-40	-36	-42	-44	-45	-47	-56	-76	-83	
Mid Bumper Level - Level A	432	-172	-148	-119	-96	-95	-84	-79	-81	-83	-84	-86	-88	-89	-93	-109	-130	-130	

All measurements are in millimeters and have a tolerance of ± 3 mm.

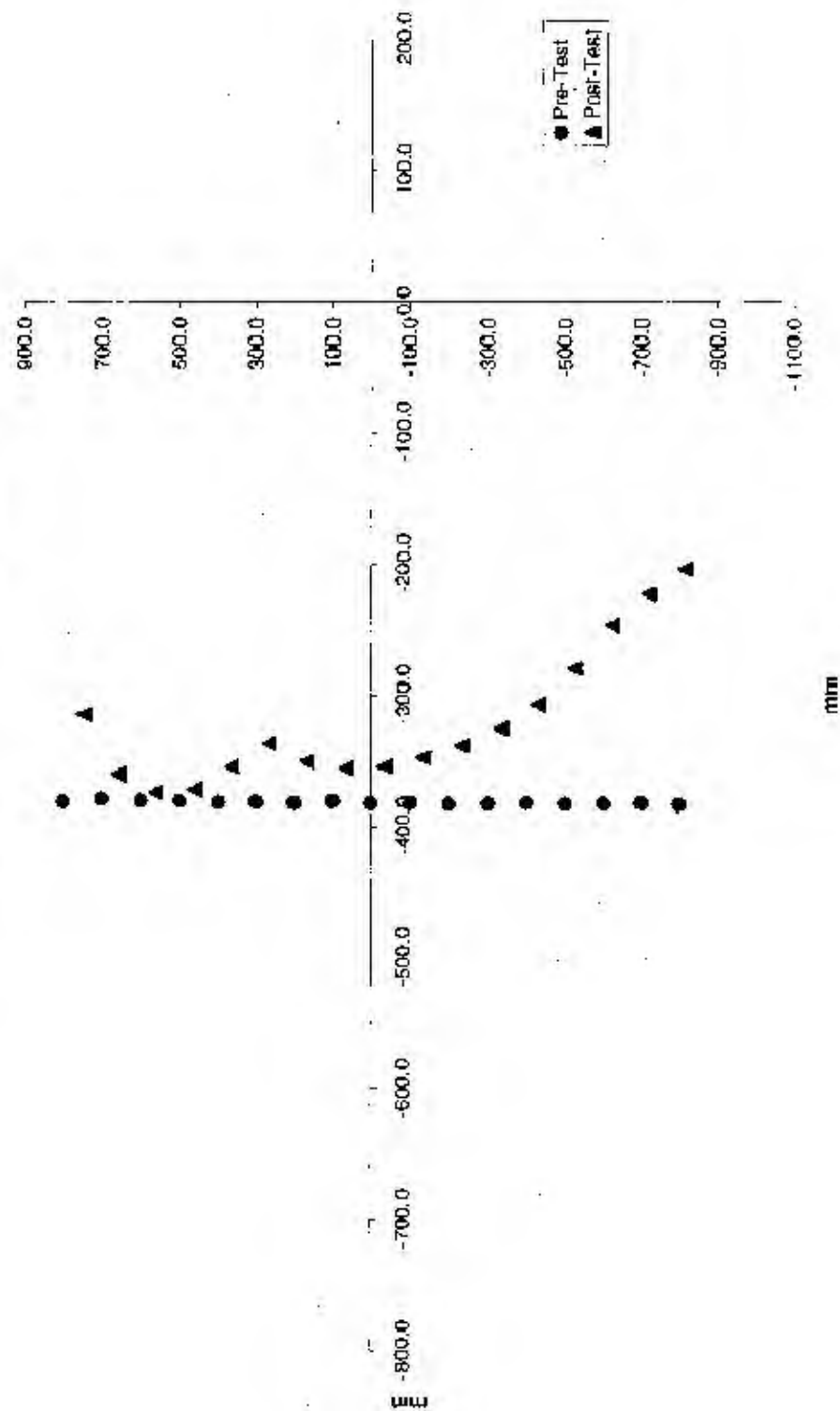
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Level D - Deformable Barrier Face Profile 4-17



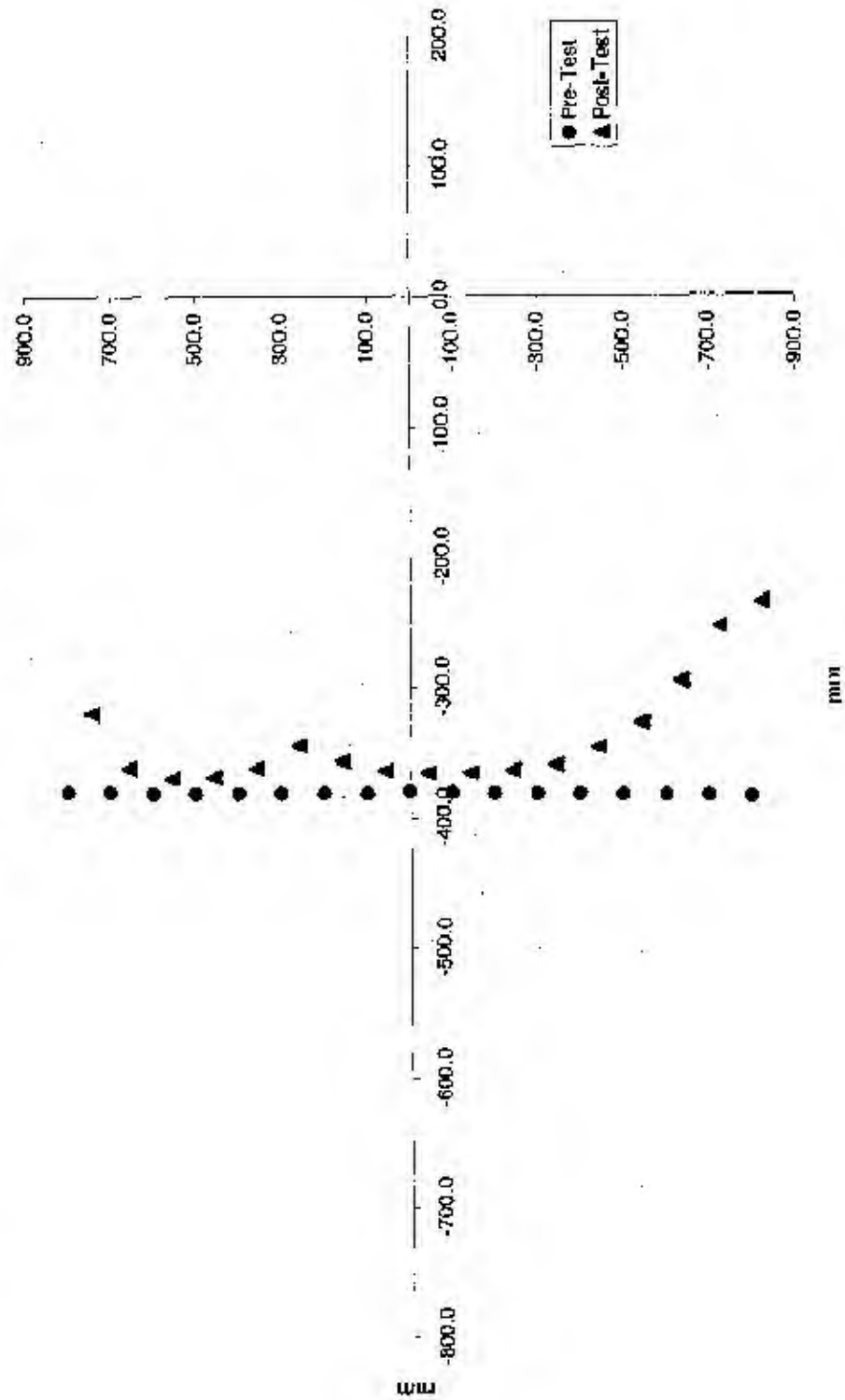
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Level C - Deformable Barrier Face Profile 18-34



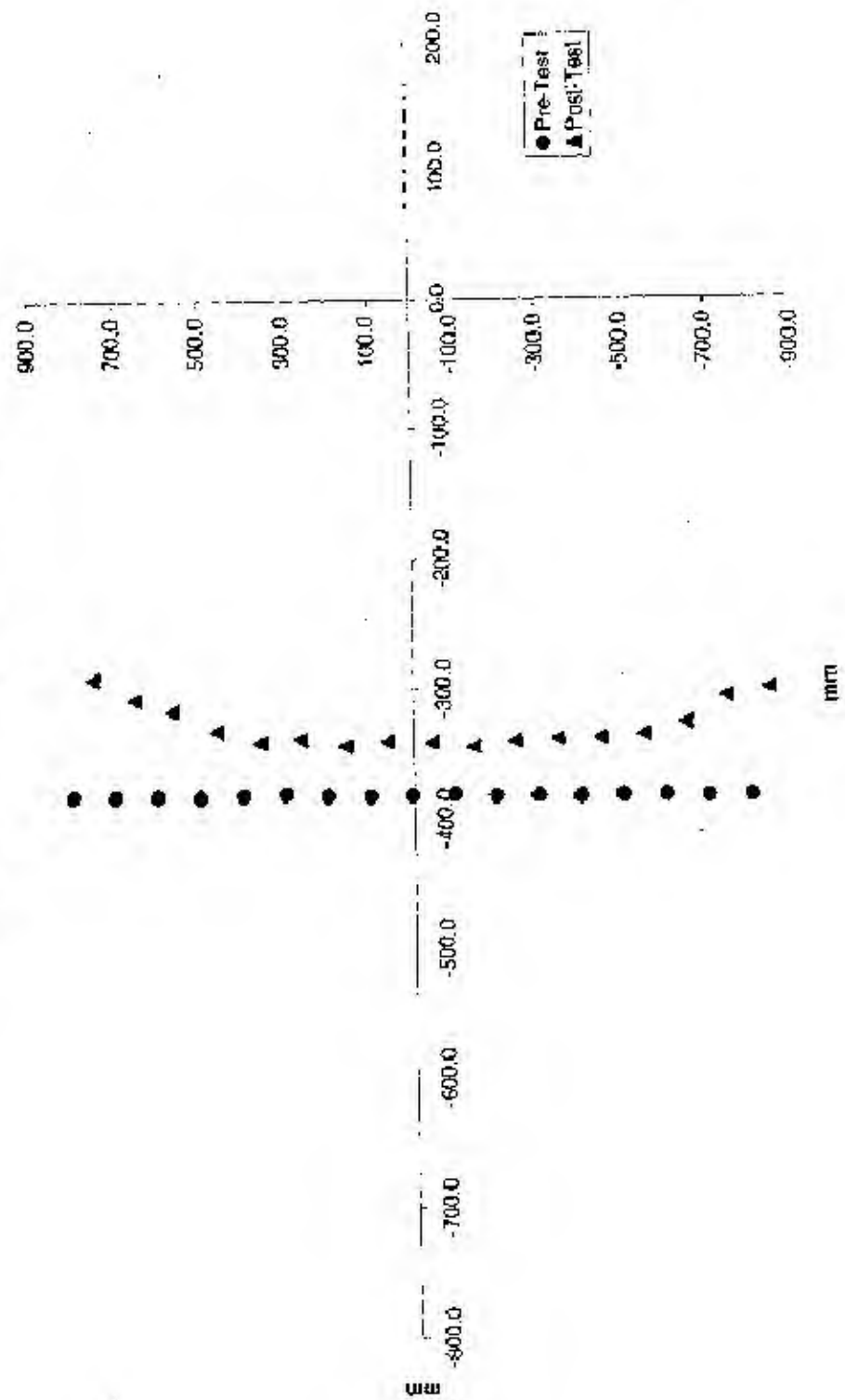
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

NHTSA No.: C30512

Vehicle: 2003 BMW 325i 4-door sedan

Level B - Deformable Barrier Face Profile 35-51



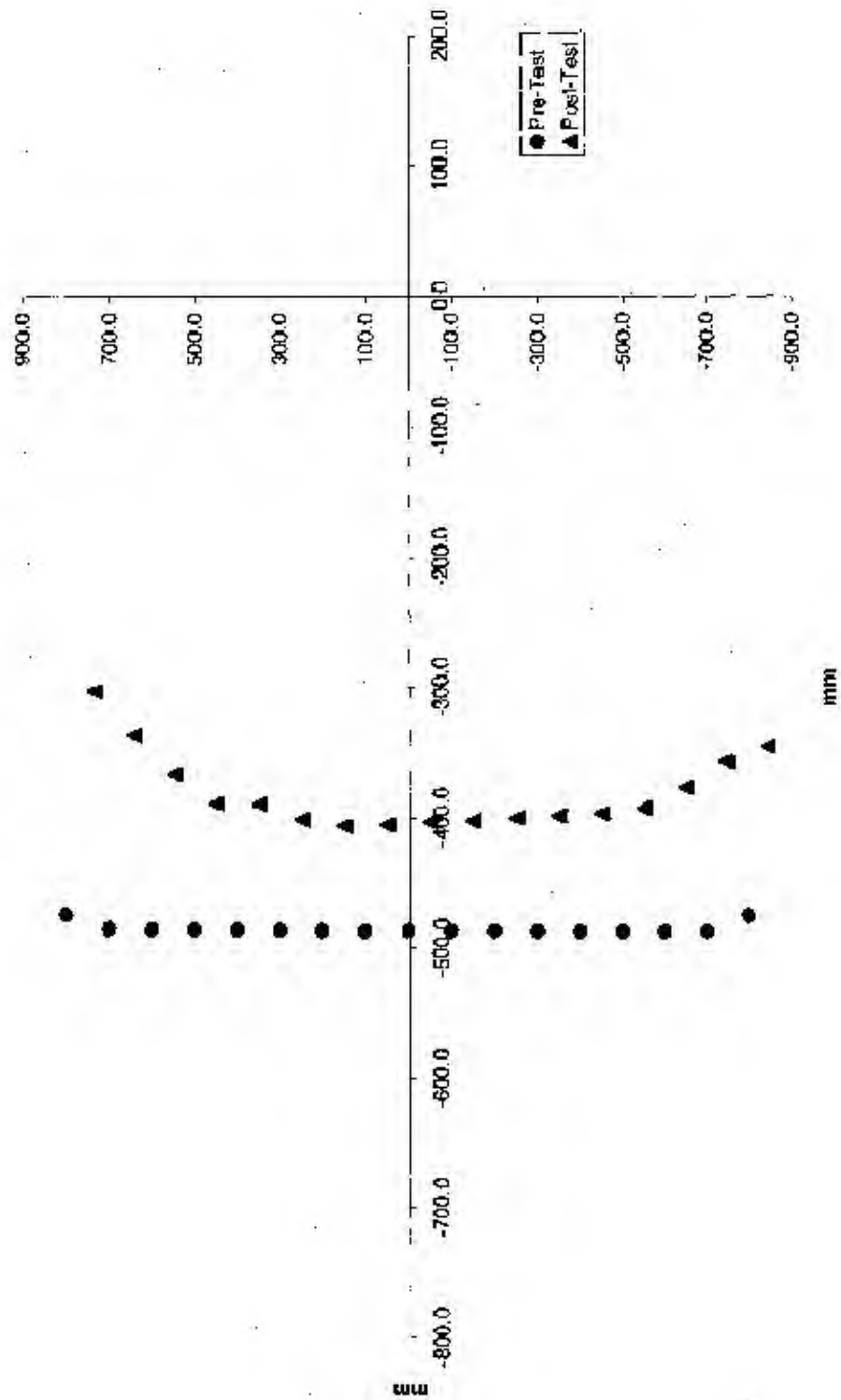
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Level A - Deformable Barrier Face Profile 52-68



Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Deformable Barrier Face Profile

Level D - Top Stack

Pre-Test

Index	Xmm	Ymm	Zmm
1	-381	800	-36
2	-379	700	-37
3	-380	600	-37
4	-380	500	-38
5	-381	400	-39
6	-381	300	-39
7	-382	200	-40
8	-380	101	-40
9	-382	0	-41
10	-382	-100	-42
11	-383	-200	-42
12	-382	-300	-43
13	-382	-400	-43
14	-382	-500	-44
15	-382	-600	-45
16	-382	-700	-45
17	-383	-800	-46

Post-Test

Index	Xmm	Ymm	Zmm
1	-315	744	-81
2	-360	657	-79
3	-374	559	-79
4	-372	460	-77
5	-355	361	-76
6	-337	263	-74
7	-350	165	-73
8	-356	66	-66
9	-354	-35	-64
10	-348	-135	-64
11	-339	-235	-60
12	-326	-335	-55
13	-307	-433	-53
14	-280	-529	-54
15	-247	-623	-58
16	-223	-720	-59
17	-203	-818	-58

Difference

Index	Xmm	Ymm	Zmm
1	-66	56	45
2	-19	43	42
3	-6	41	42
4	-9	40	39
5	-26	39	36
6	-44	37	35
7	-31	35	33
8	-24	35	27
9	-27	35	22
10	-34	35	22
11	-44	35	18
12	-56	34	12
13	-74	33	9
14	-102	29	10
15	-135	23	13
16	-159	20	13
17	-180	18	12

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Deformable Barrier Face Profile Cont'd.

Level C - Mid Level

Pre-Test

Index	Xmm	Ymm	Zmm
18	-379	803	-166
19	-380	702	-166
20	-380	602	-167
21	-380	502	-168
22	-380	402	-168
23	-380	302	-168
24	-380	202	-169
25	-381	102	-170
26	-379	2	-171
27	-380	-98	-171
28	-381	-198	-172
29	-381	-298	-173
30	-381	-398	-173
31	-382	-498	-174
32	-382	-598	-174
33	-383	-699	-175
34	-383	-798	-175

Post-Test

Index	Xmm	Ymm	Zmm
18	-320	746	-209
19	-361	659	-208
20	-369	559	-207
21	-368	459	-205
22	-361	360	-204
23	-345	260	-201
24	-356	160	-196
25	-363	60	-192
26	-365	-40	-188
27	-365	-141	-183
28	-363	-241	-180
29	-359	-342	-176
30	-346	-442	-175
31	-327	-540	-174
32	-295	-636	-177
33	-253	-726	-184
34	-234	-823	-180

Difference

Index	Xmm	Ymm	Zmm
18	-59	57	43
19	-18	44	42
20	-11	43	40
21	-12	43	38
22	-19	43	36
23	-36	42	33
24	-24	42	27
25	-18	42	22
26	-14	42	17
27	-15	43	12
28	-17	43	8
29	-22	44	4
30	-35	43	2
31	-55	42	0
32	-87	37	2
33	-130	28	9
34	-149	25	5

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Deformable Barrier Face Profile Cont'd.

Level B - Top of Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
35	-380	802	-291
36	-380	703	-291
37	-380	603	-292
38	-381	502	-293
39	-380	402	-294
40	-379	302	-294
41	-381	202	-294
42	-382	102	-295
43	-381	2	-296
44	-381	-98	-296
45	-382	-198	-297
46	-382	-298	-298
47	-383	-398	-298
48	-383	-498	-299
49	-383	-598	-299
50	-384	-698	-299
51	-384	-798	-300

Post-Test

Index	Xmm	Ymm	Zmm
35	-290	751	-298
36	-306	653	-303
37	-315	565	-313
38	-330	461	-320
39	-340	360	-320
40	-337	265	-320
41	-343	159	-317
42	-340	59	-312
43	-341	-47	-306
44	-345	-146	-300
45	-340	-245	-296
46	-338	-344	-293
47	-338	-446	-291
48	-336	-548	-290
49	-327	-647	-288
50	-307	-744	-289
51	-301	-843	-279

Difference

Index	Xmm	Ymm	Zmm
35	-90	51	7
36	-74	49	12
37	-65	38	21
38	-50	42	28
39	-41	42	26
40	-42	37	26
41	-38	43	23
42	-42	42	17
43	-40	50	10
44	-36	48	3
45	-42	47	-1
46	-44	47	-4
47	-45	48	-7
48	-47	50	-8
49	-55	49	-11
50	-76	45	-10
51	-83	45	-22

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

Deformable Barrier Face Profile Cont'd.

Level A - Mid Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
52	-474	802	-416
53	-484	704	-417
54	-485	604	-418
55	-485	504	-419
56	-485	403	-419
57	-485	304	-420
58	-486	204	-421
59	-486	104	-421
60	-486	3	-423
61	-486	-96	-423
62	-486	-196	-423
63	-487	-297	-425
64	-487	-397	-425
65	-487	-496	-426
66	-487	-597	-426
67	-487	-697	-426
68	-475	-795	-428

Post-Test

Index	Xmm	Ymm	Zmm
52	-302	735	-423
53	-336	643	-429
54	-366	548	-433
55	-389	450	-435
56	-390	350	-433
57	-402	251	-435
58	-406	151	-434
59	-405	52	-432
60	-403	-49	-431
61	-402	-148	-429
62	-401	-249	-426
63	-399	-349	-425
64	-397	-449	-423
65	-393	-548	-421
66	-378	-647	-416
67	-357	-746	-411
68	-345	-843	-408

Difference

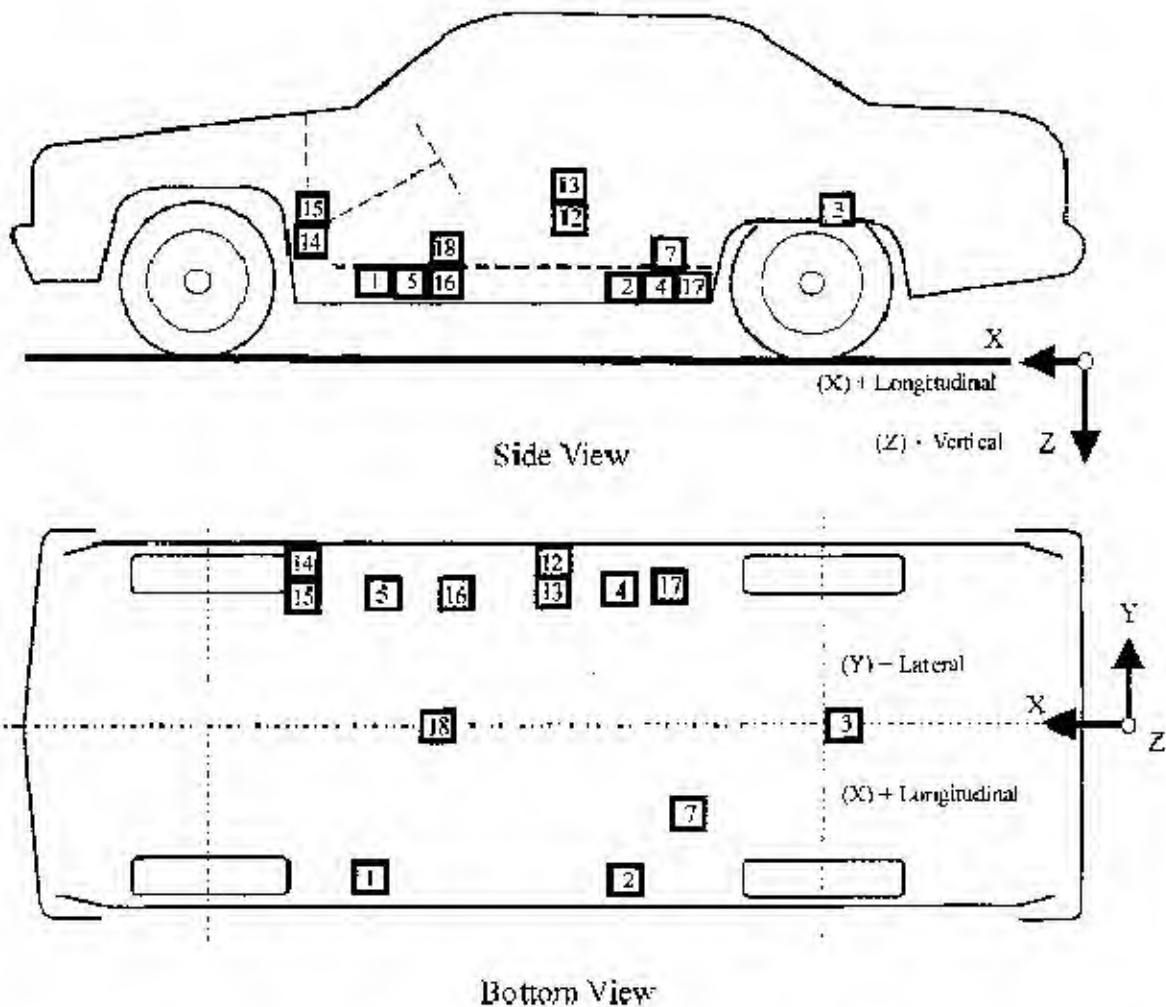
Index	Xmm	Ymm	Zmm
52	-172	66	6
53	-148	61	12
54	-118	56	14
55	-96	53	16
56	-95	53	14
57	-84	53	14
58	-79	52	13
59	-81	52	10
60	-83	52	8
61	-84	52	6
62	-86	52	3
63	-88	52	1
64	-89	52	-2
65	-93	52	-5
66	-109	51	-10
67	-130	49	-15
68	-130	48	-20

Data Sheet 13

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



- | | |
|--|--|
| 1-Right Front Side Sill | 10-Left Rear Door Mid Rear (omitted) |
| 2-Right Side Sill at Rear Seat | 11-Left Rear Door Upper Centerline (omitted) |
| 3-Rear Floorpan above Axle | 12-Left Side Lower B-pillar |
| 4-Left Side Sill at Rear Seat | 13-Left Side Middle B-pillar |
| 5-Left Front Side Sill | 14-Left Side Lower A-pillar |
| 6-Left Front Door on Centerline (omitted) | 15-Left Side Middle A-pillar |
| 7-Right Rear Occupant Compartment | 16-Left Side Front Seat Track at H-point |
| 8-Left Front Door Mid Rear (omitted) | 17-Left Rear Seat Track at H-point |
| 9-Left Front Door Upper Centerline (omitted) | 18-Vehicle Center of Gravity |

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

TEST NUMBER: 030430
No. LOCATION

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

X Y Z

1 RIGHT SIDE SILL AT FRONT SEAT	2808 mm	700 mm	-251 mm			
LONGITUDINAL				2.9 g	@ 53.0 ms	7.2 g @ 20.9 ms
LATERAL				---	---	---
VERTICAL				4.3 g	@ 27.8 ms	5.6 g @ 19.9 ms
RESULTANT				---	---	---

2 RIGHT SIDE SILL AT REAR SEAT	1928 mm	682 mm	-210 mm			
LONGITUDINAL				3.5 g	@ 52.6 ms	7.3 g @ 20.9 ms
LATERAL				20.0 g	@ 8.5 ms	2.0 g @ 194.7 ms
VERTICAL				6.3 g	@ 35.4 ms	2.4 g @ 23.8 ms
RESULTANT				20.1 g	@ 8.5 ms	

3 REAR FLOORPAN ABOVE AXLE	898 mm	0 mm	-480 mm			
LONGITUDINAL				1.5 g	@ 113.8 ms	5.5 g @ 24.2 ms
LATERAL				17.1 g	@ 28.1 ms	1.8 g @ 147.4 ms
VERTICAL				5.1 g	@ 44.2 ms	4.7 g @ 78.0 ms
RESULTANT				17.3 g	@ 27.6 ms	

4 LEFT SIDE SILL AT REAR SEAT	1898 mm	-682 mm	-208 mm			
LATERAL				58.5 g	@ 7.0 ms	27.2 g @ 13.9 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

TEST NUMBER: 030430

No. LOCATION

X

Y

Z

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

5 LEFT SIDE SILL
AT FRONT SEAT
LATERAL

2814 mm -700 mm -255 mm

7 RIGHT REAR OCCUPANT
COMPARTMENT
LATERAL

1798 mm 410 mm -217 mm

18.8 g @ 8.2 ms 1.8 g @ 194.5 ms

12 LEFT LOWER B-POST
LATERAL

2001 mm -690 mm -415 mm

226.3 g @ 5.2 ms 75.6 g @ 18.8 ms

13 LEFT MIDDLE B-POST
LATERAL

2003 mm -690 mm -815 mm

144.0 g @ 5.0 ms 49.8 g @ 25.0 ms

14 LEFT LOWER A-POST
LATERAL

3063 mm -770 mm -445 mm

248.8 g @ 4.0 ms 71.3 g @ 19.3 ms

15 LEFT MIDDLE A-POST
LATERAL

3043 mm -770 mm -772 mm

60.9 g @ 13.2 ms 21.0 g @ 20.8 ms

16 LEFT FRONT SEAT TRACK
LATERAL

2279 mm -771 mm -345 mm

17 LEFT REAR SEAT TRACK
LATERAL

1478 mm -770 mm -420 mm

25.4 g @ 11.8 ms 2.7 g @ 190.5 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

TEST NUMBER: 030430

NO. LOCATION

	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
18 VEHICLE CENTER OF GRAVITY	2277 mm	0 mm	475 mm		
LONGITUDINAL					
LATERAL				15.8 g @ 22.7 ms	22.3 g @ 21.4 ms
VERTICAL				194.8 g @ 24.6 ms	89.4 g @ 29.2 ms
RESULTANT				59.4 g @ 25.0 ms	59.9 g @ 29.6 ms
				203.5 g @ 24.6 ms	

REFERENCE: X: + FORWARD FROM REAR BUMPER

Y: - RIGHTWARD FROM VEHICLE CENTERLINE

Z: + DOWNWARD FROM GROUND LEVEL

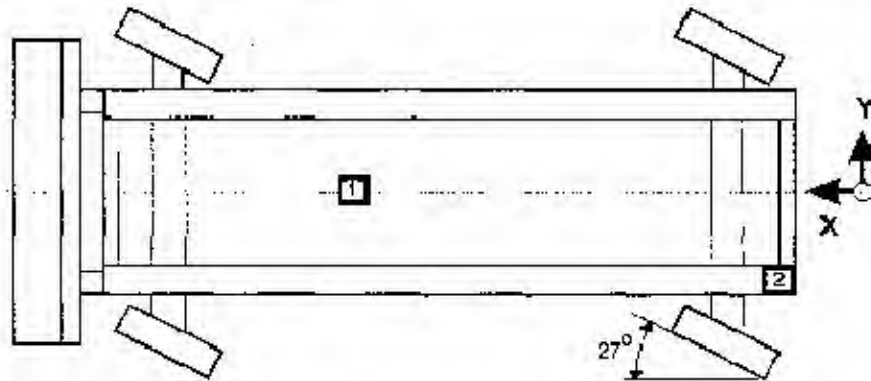
For acceleration data sign convention, see Report Sign Convention in Appendix D.
See DATA ACQUISITION EXPLANATIONS on page 2-3.

Data Sheet 14

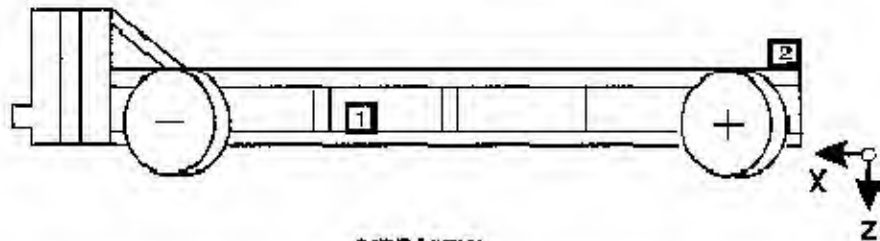
MDB Accelerometer Locations and Data Summary

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



TOP VIEW



SIDE VIEW

Accel. No.	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X*	Y*	Z*	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1	MDB Center of Gravity	1855	0	-520				
	Longitudinal X				2.7	145.0	-22.4	37.2
	Lateral Y				5.8	78.9	-12.0	26.6
	Vertical Z				4.8	231.0	-9.1	23.0
	Resultant R				23.4	36.6		
2	Rear Frame Member	412	-677	-625				
	Longitudinal X				3.7	120.9	-24.6	33.1
	Lateral Y				3.1	20.3	-3.6	63.4

*Reference: X = Rear Bumper (+ Forward)

Y = Vehicle Centerline (+ To Right)

Z = Ground Level (+ Down)

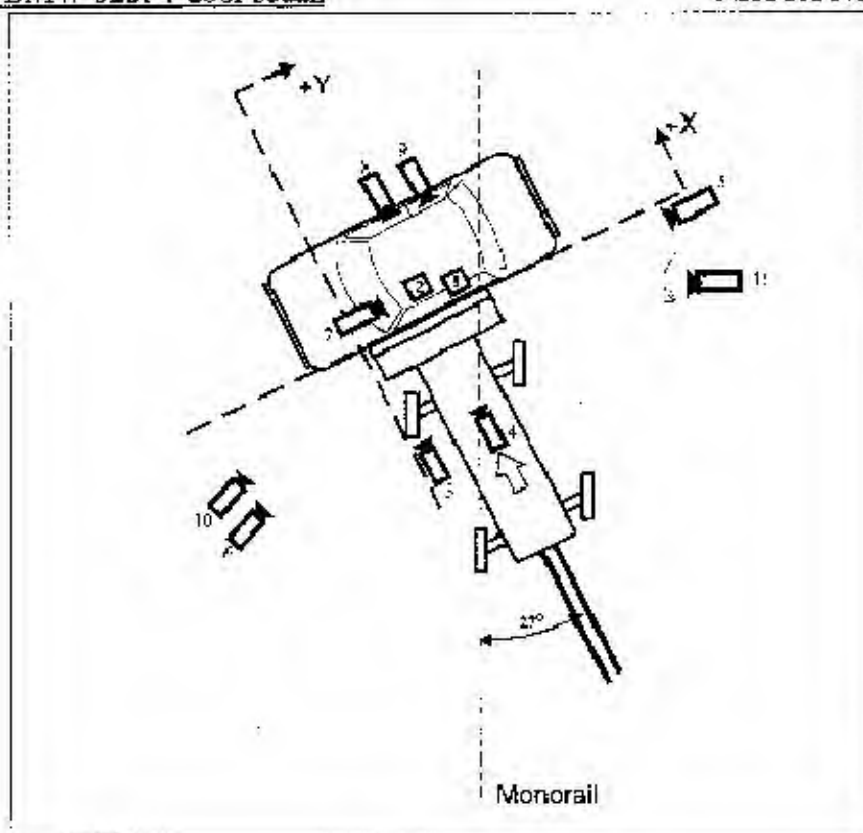
All measurements accurate to within ± 3 mm.

Data Sheet 15

High-Speed Camera Locations and Data Summary

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512



Camera Number	Location	Location, mm			Lens		Speed (fps)
		X	Y	Z	(deg)	(mm)	
1	Overhead wide	250	2150	-5750	-79.1	8.5	1035
2	Overhead tight	370	1800	-5750	-85.5	17	N/A ¹
3	Onboard MDB left side	-1750	-40	-720	-0.5	13	1025
4	Onboard MDB center	-2480	830	-1353	-5.1	25	1000
5	Right side of MDB	0	10,350	-1120	0.8	13	1005
6	Left side of MDB	-1750	-6200	-1100	-2.0	13	N/A ²
7	Onboard vehicle front	550	-270	-1130	-11.0	8	385
8	Onboard side front door	1657	800	-1020	-3.2	8	N/A ³
9	Onboard side rear door	1552	1670	-1030	-5.9	8	N/A ³
10	Digital overall event	-1500	-6500	-1150	-1.7	13	N/A ³
11	Real-time Panning-Video	N/A	N/A	N/A	N/A	Zoom	30

-X: Forward (referenced to MDB) from impact point
+Y: Rightward (referenced to MDB) from impact point
+Z: Downward from ground level

¹ No LEDs (camera was set to run at 1000 frames/sec).

² Camera too slow to time.

³ Camera did not run.

Section 5

Vehicle Fuel System Integrity

Data Sheet 16

FMVSS 301 Fuel System Integrity Data

NHTSA No.: C30512

Test Date: 4/30/03

Vehicle Year/Make/Model/Body Style: 2003 BMW 325i 4-door sedan

Test Vehicle Impact Type :

- ☐ Frontal (48.28 km/h)
☐ Oblique (48.28 km/h) with ☐° barrier
face first contacting the (driver/passenger) side
☐ Rear Moving Barrier (48.28 km/h)
☐ Lateral Moving Barrier (32.19 km/h)
☒ Side Impact Moving Deformable Barrier
(38.5 mph) contacting the driver's side

Fuel Spillage Measurement:

1. From impact until vehicle motion ceases
2. For five-minute period after vehicle motion ceases
3. For next 25 minutes.

Actual	Maximum Allowed
0 g	28 g
0 g	142 g
0 g	28 g/1 minute

Solvent Spillage Details :

N/A

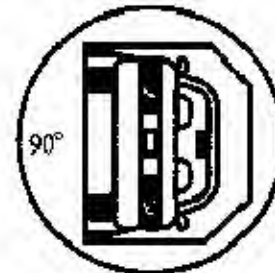
Data Sheet 17

FMVSS 301 Rollover Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

0 - 90 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>30</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
Total	<u>6</u>	minutes	<u>30</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

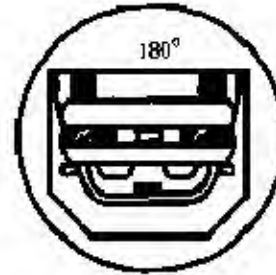
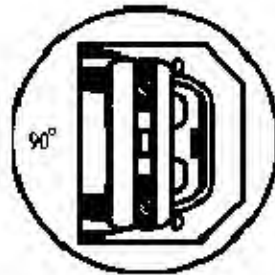
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

90 - 180 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

<u>142 g</u>	<u>28 g</u>	<u>28 g</u>	<u>28 g</u>
--------------	-------------	-------------	-------------

3. Actual Test Vehicle Solvent Spillage:

<u>0 g</u>	<u>0 g</u>	<u>0 g</u>	<u>N/A</u>
------------	------------	------------	------------

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

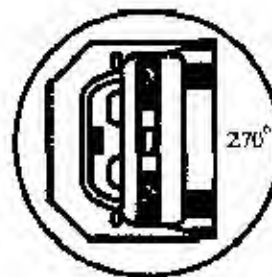
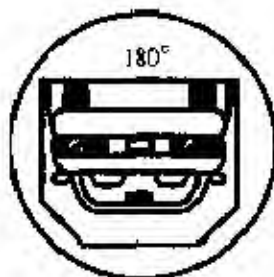
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

180 • 270 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time ÷ 5 minutes 0 seconds

Total 6 minutes 30 seconds

Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

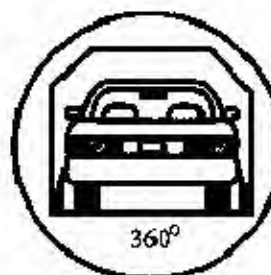
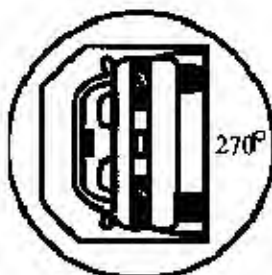
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2003 BMW 325i 4-door sedan

NHTSA No.: C30512

270 - 360 Degrees



1. Determination Of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds

(Spec. Range = 1 to 3 minutes)

FMVSS 301 Position Hold Time + 5 minutes 0 seconds

Total 6 minutes 30 seconds

Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

Appendix A

Photographs

List of Photographs

<u>Figure</u>	<u>Description</u>	<u>Page</u>
Figure A-1	Pre-Test Front View of Test Vehicle	A-4
Figure A-2	Post-Test Front View of Test Vehicle	A-5
Figure A-3	Pre-Test Impacted Side View of Test Vehicle	A-6
Figure A-4	Post-Test Impacted Side View of Test Vehicle	A-7
Figure A-5	Pre-Test Rear View of Test Vehicle	A-8
Figure A-6	Post-Test Rear View of Test Vehicle	A-9
Figure A-7	Pre-Test Frontal View of Impactor Face	A-10
Figure A-8	Post-Test Frontal View of Impactor Face	A-11
Figure A-9	Pre-Test Left Side View of Impactor Face	A-12
Figure A-10	Post-Test Left Side View of Impactor Face	A-13
Figure A-11	Pre-Test Right Side View of Impactor Face	A-14
Figure A-12	Post-Test Right Side View of Impactor Face	A-15
Figure A-13	Pre-Test Top View of Impactor Face	A-16
Figure A-14	Post-Test Top View of Impactor Face	A-17
Figure A-15	Pre-Test Frontal View of MDB	A-18
Figure A-16	Pre-Test Overhead View of MDB Aligned with Vehicle	A-19
Figure A-17	Post-Test Overhead View of MDB and Vehicle	A-20
Figure A-18	Pre-Test Right Occupant Compartment View of Front SID	A-21
Figure A-19	Pre-Test Right Occupant Compartment View of Rear SID	A-22
Figure A-20	Pre-Test Left View of Front SID	A-23
Figure A-21	Post-Test Left View of Front SID	A-24
Figure A-22	Pre-Test Left View of Front SID and Belt Position	A-25
Figure A-23	Pre-Test Left View of Front SID and Door Clearance	A-26
Figure A-24	Post-Test Left View of Front SID and Door Clearance	A-27
Figure A-25	Pre-Test Left View of Rear SID	A-28
Figure A-26	Post-Test Left View of Rear SID	A-29
Figure A-27	Pre-Test Left of Rear SID and Belt Position	A-30
Figure A-28	Pre-Test Left View of Rear SID and Door Clearance	A-31

List of Photographs, Cont'd.

<u>Figure</u>	<u>Description</u>	<u>Page</u>
Figure A-29	Post-Test Left View of Rear SID and Door Clearance	A-32
Figure A-30	Pre-Test Interior of Front Door	A-33
Figure A-31	Post-Test Interior of Front Door Showing SID Impact Locations	A-34
Figure A-32	Post-Test Front SID Contact - View 1	A-35
Figure A-33	Post-Test Front SID Contact - View 2	A-36
Figure A-34	Post-Test Front SID Contact - View 3	A-37
Figure A-35	Post-Test Front SID Contact - View 4	A-38
Figure A-36	Post-Test Front SID Contact - View 5	A-39
Figure A-37	Pre-Test Interior of Rear Panel	A-40
Figure A-38	Post-Test Interior of Rear Panel Showing SID Impact Locations	A-41
Figure A-39	Post-Test Rear SID Contact - View 1	A-42
Figure A-40	Post-Test Rear SID Contact - View 2	A-43
Figure A-41	Post-Test Rear SID Contact - View 3	A-44
Figure A-42	Post-Test Rear SID Contact - View 4	A-45
Figure A-43	Pre-Test Left Side View of MDB With Impactor Face in Position	A-46
Figure A-44	Pre-Test Primary Impact Point View	A-47
Figure A-45	Post-Test Primary Impact Point View	A-48
Figure A-46	Pre-Test Right Side View of MDB With Impactor Face in Position	A-49
Figure A-47	Pre-Test Secondary Impact Point View	A-50
Figure A-48	Post-Test Secondary Impact Point View	A-51
Figure A-49	Pre-Test Vehicle Certification Label View	A-52
Figure A-50	Pre-Test Vehicle Recommended Tire Pressure Label View	A-53
Figure A-51	Impact Event	A-54
Figure A-52	Pre-Test Fuel Cap	A-55
Figure A-53	Post-Test Fuel Cap	A-56
Figure A-54	FMVSS 301 Rollover View at 90°	A-57
Figure A-55	FMVSS 301 Rollover View at 180°	A-58
Figure A-56	FMVSS 301 Rollover View at 270°	A-59
Figure A-57	FMVSS 301 Rollover View at 360°	A-60

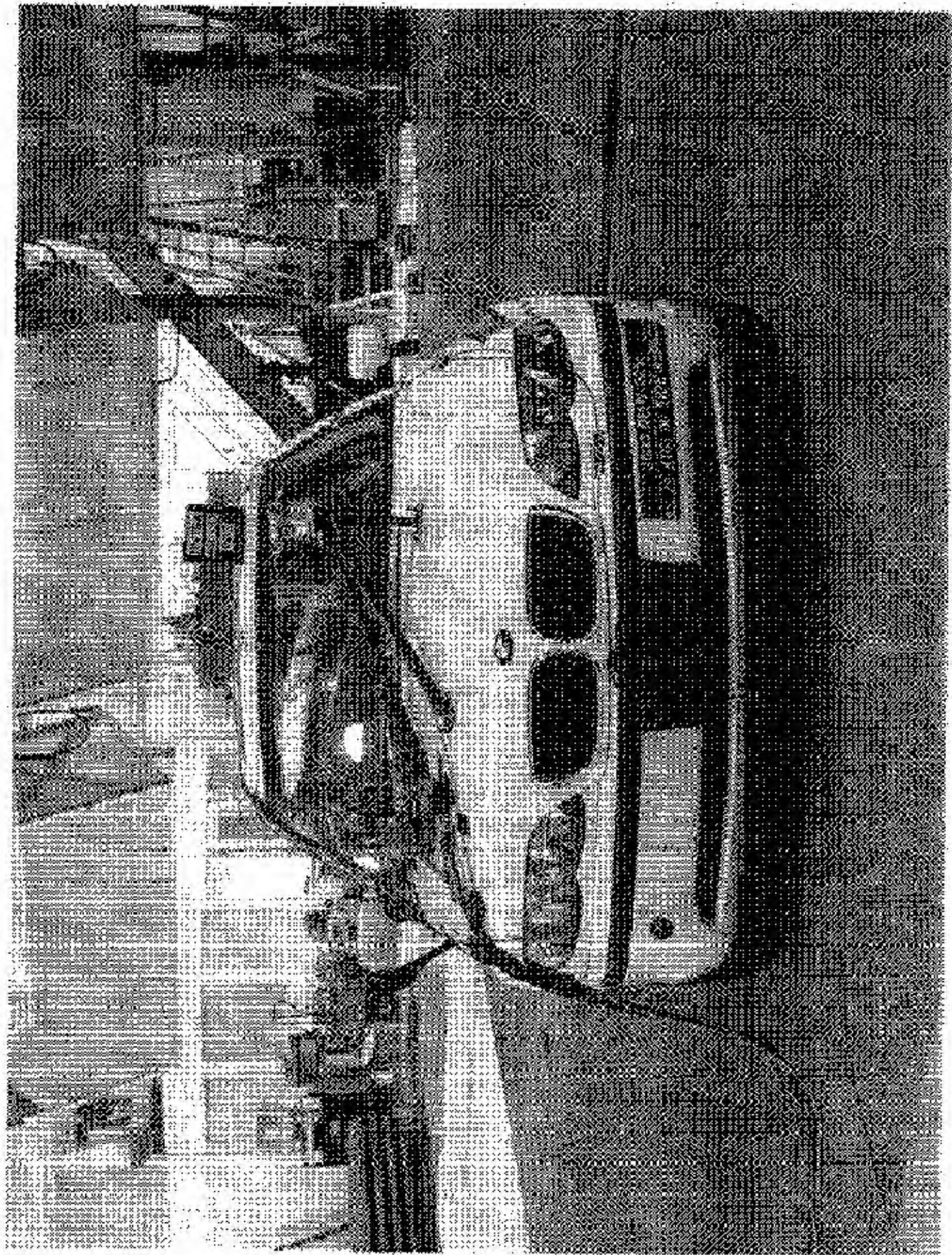


Figure A-1 Pre-Test Front View of Test Vehicle



Figure A-2 Post-Test Front View of Test Vehicle

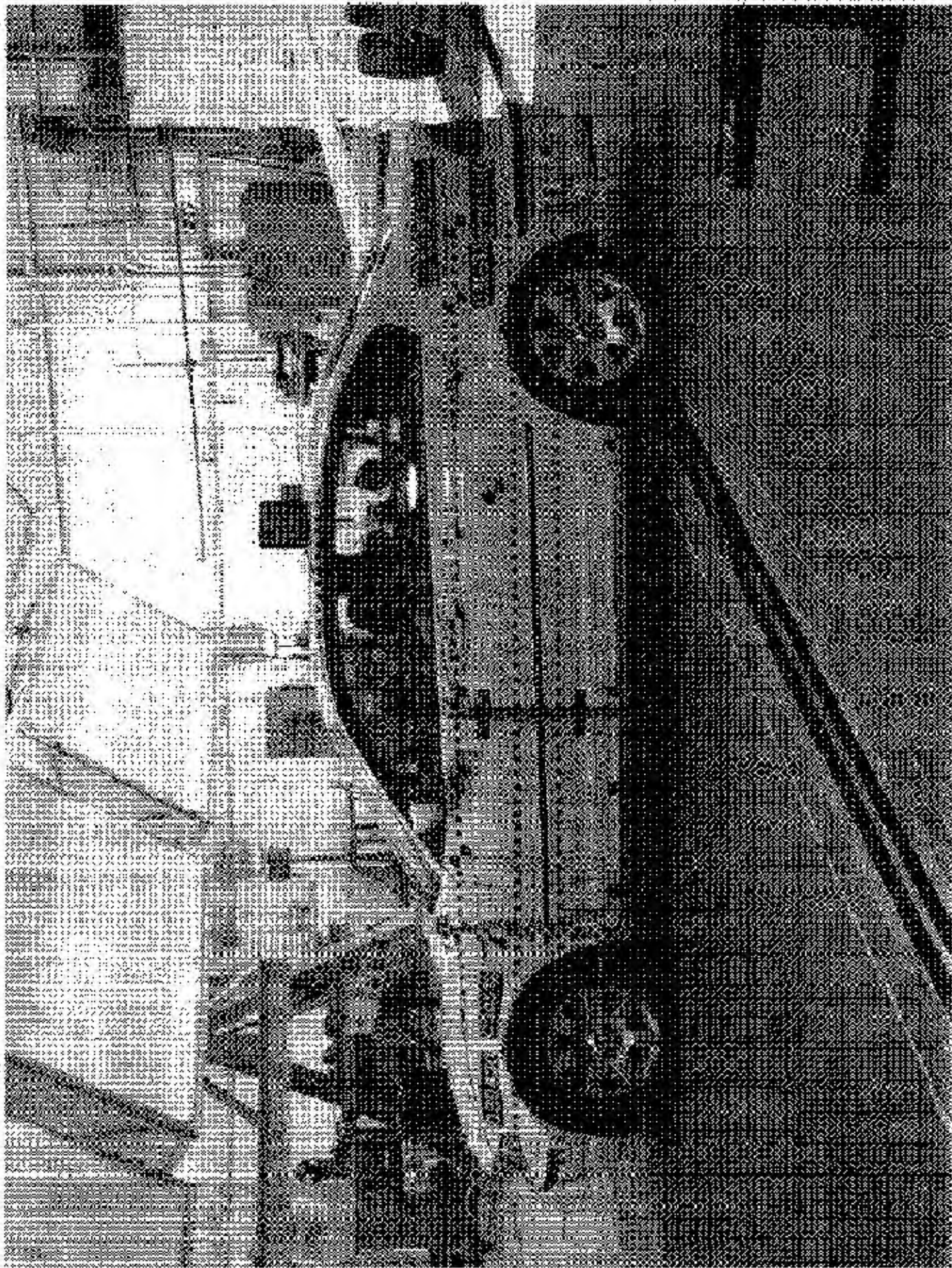


Figure A-J Pre-Test Impacted Side View of Test Vehicle

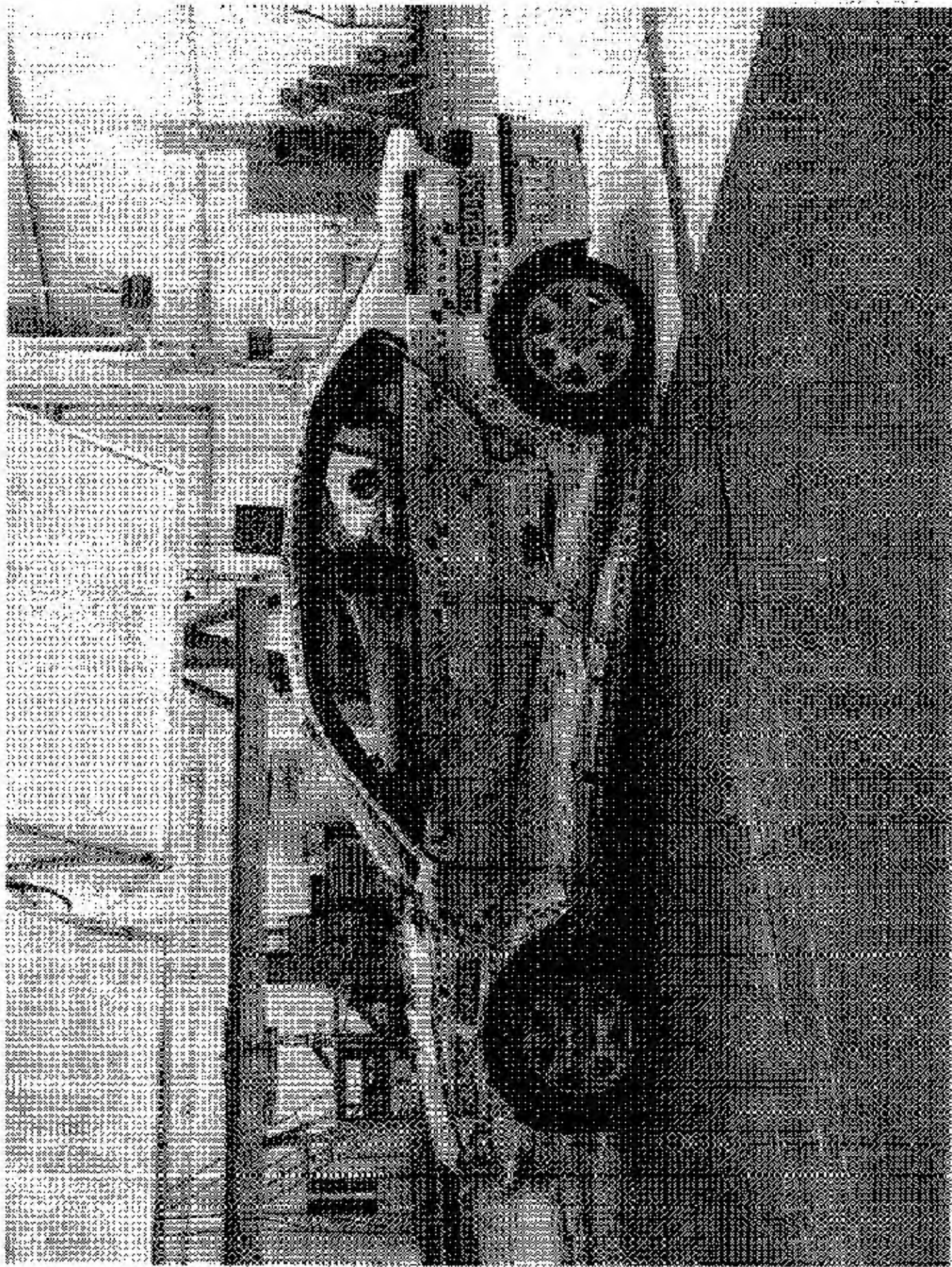


Figure A-4 Post-Test Impacted Side View of Test Vehicle

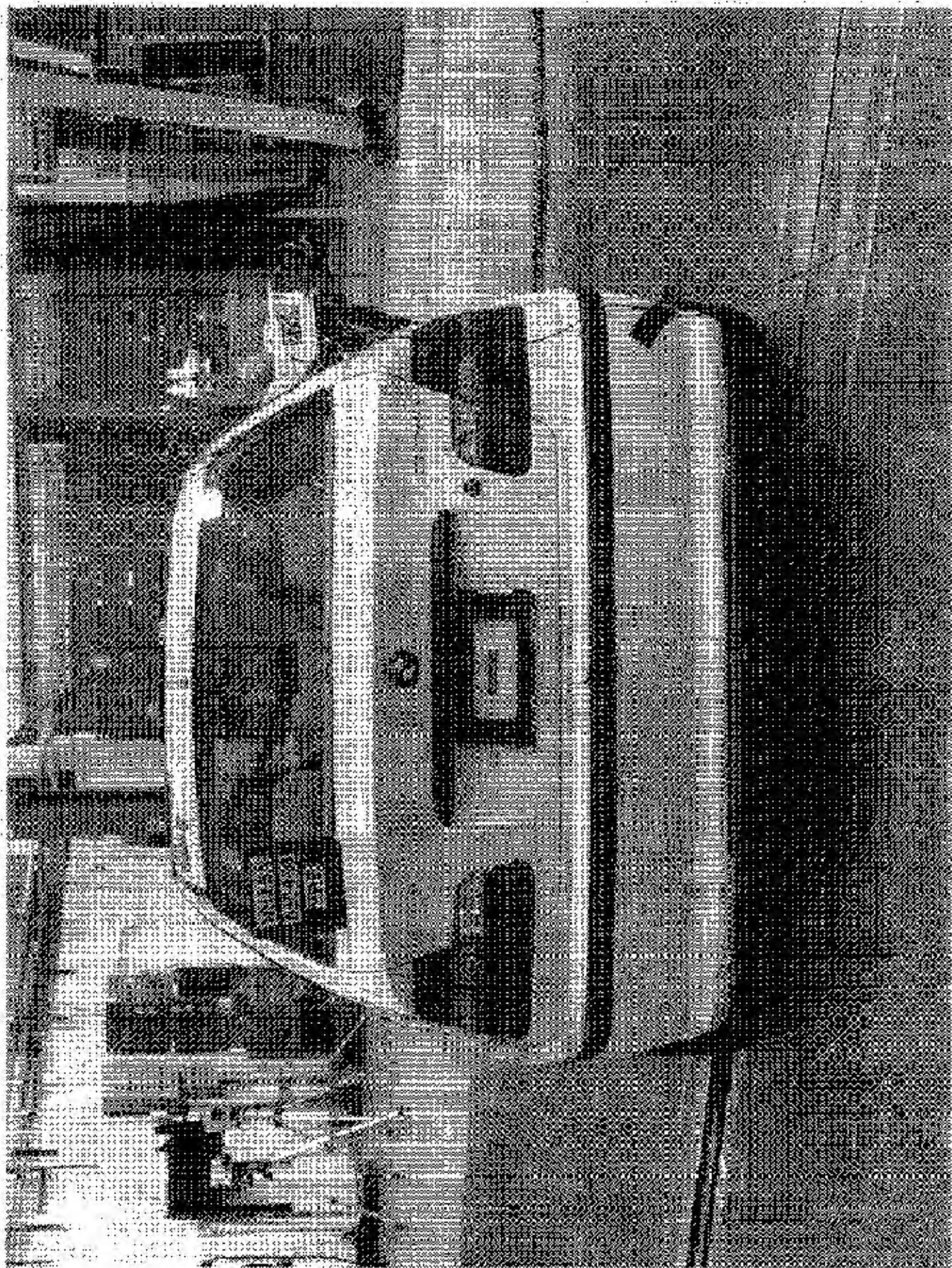


Figure A-5 Pre-Test Rear View of Test Vehicle

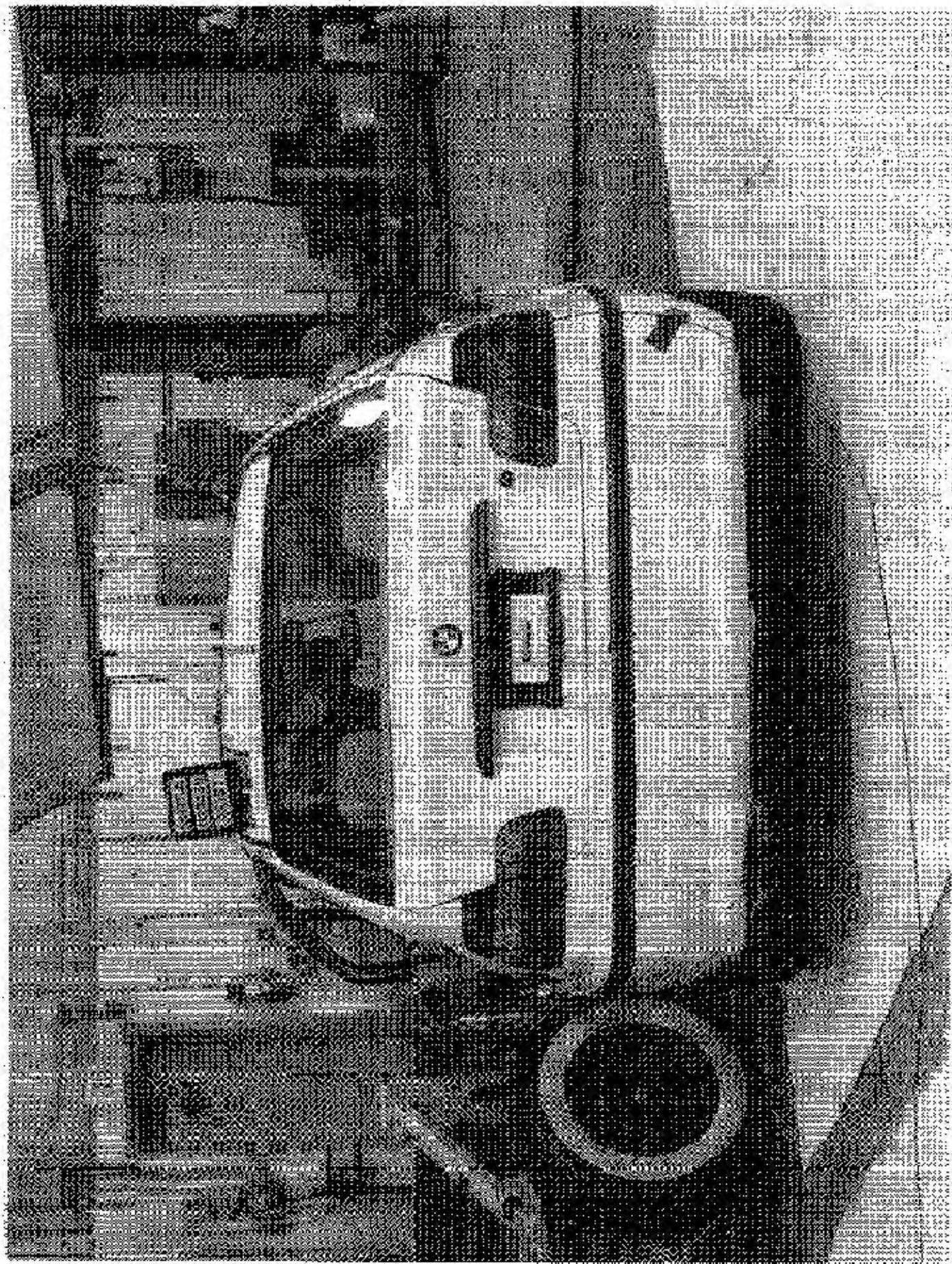


Figure A-6 Post-Test Rear View of Test Vehicle

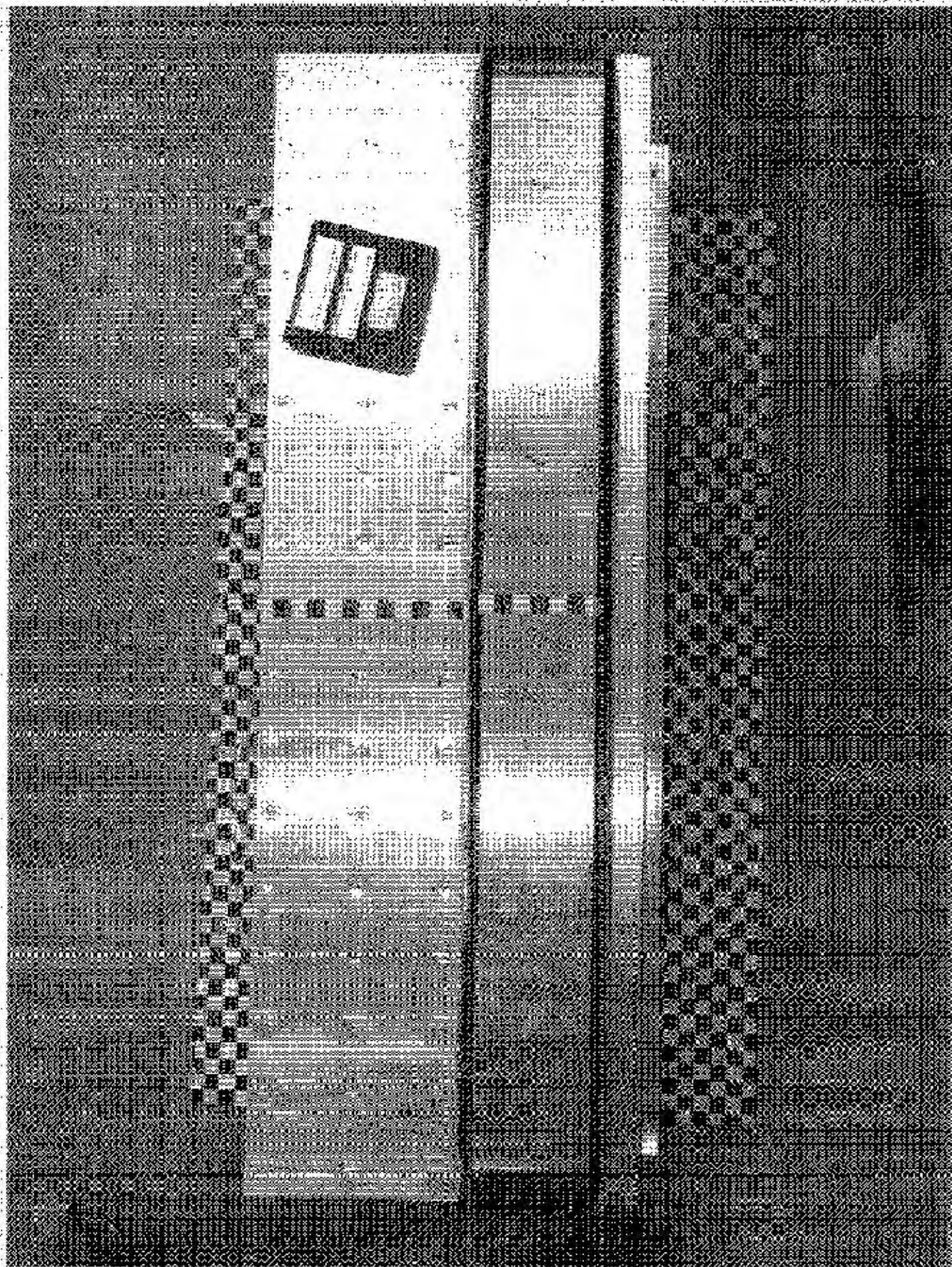


Figure A-7 Pre-Test Frontal View of Impactor Face

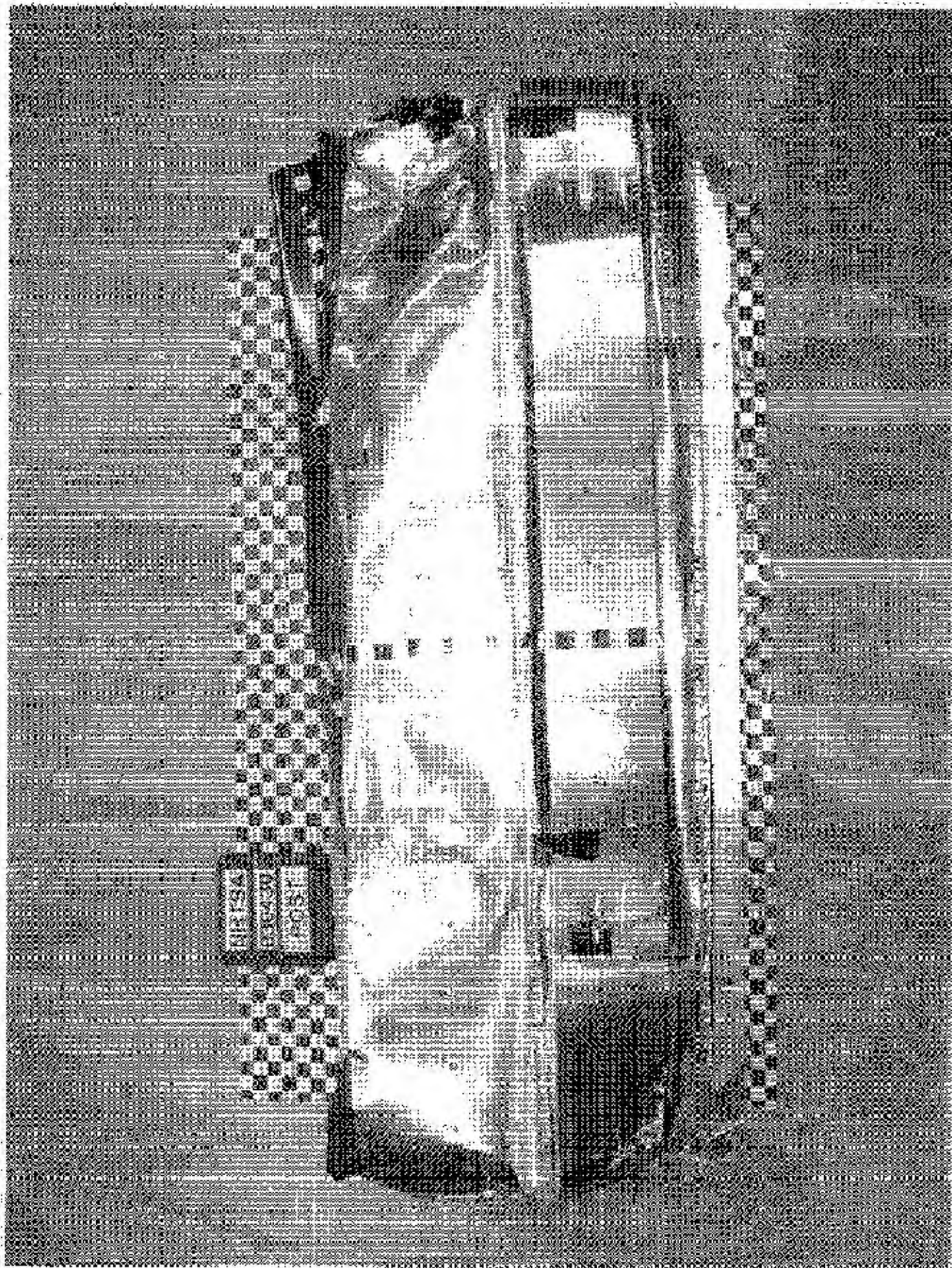


Figure A-8 Post-Test Frontal View of Impactor Face

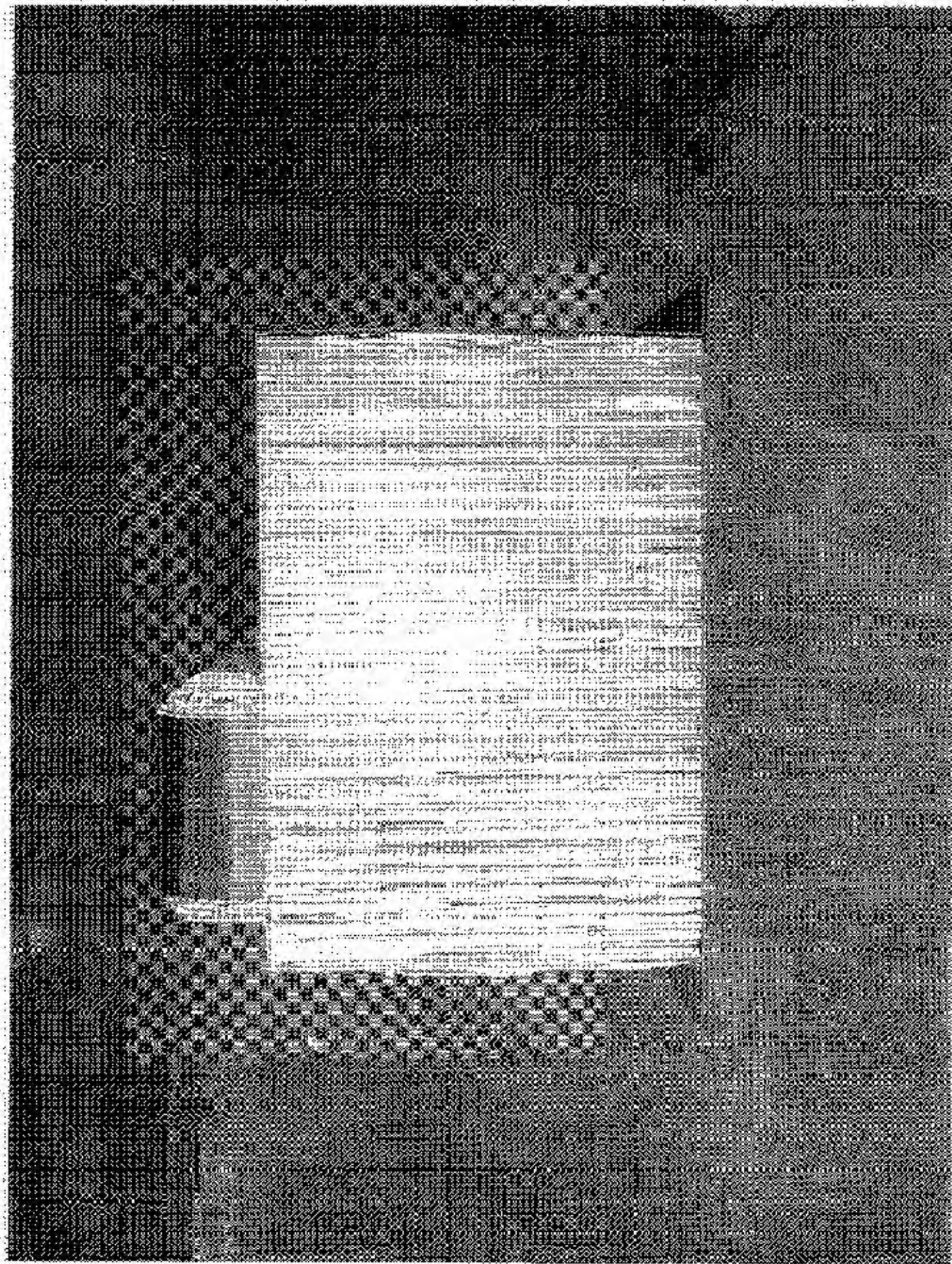


Figure A-9 Pre-Test Left Side View of Impactor Face

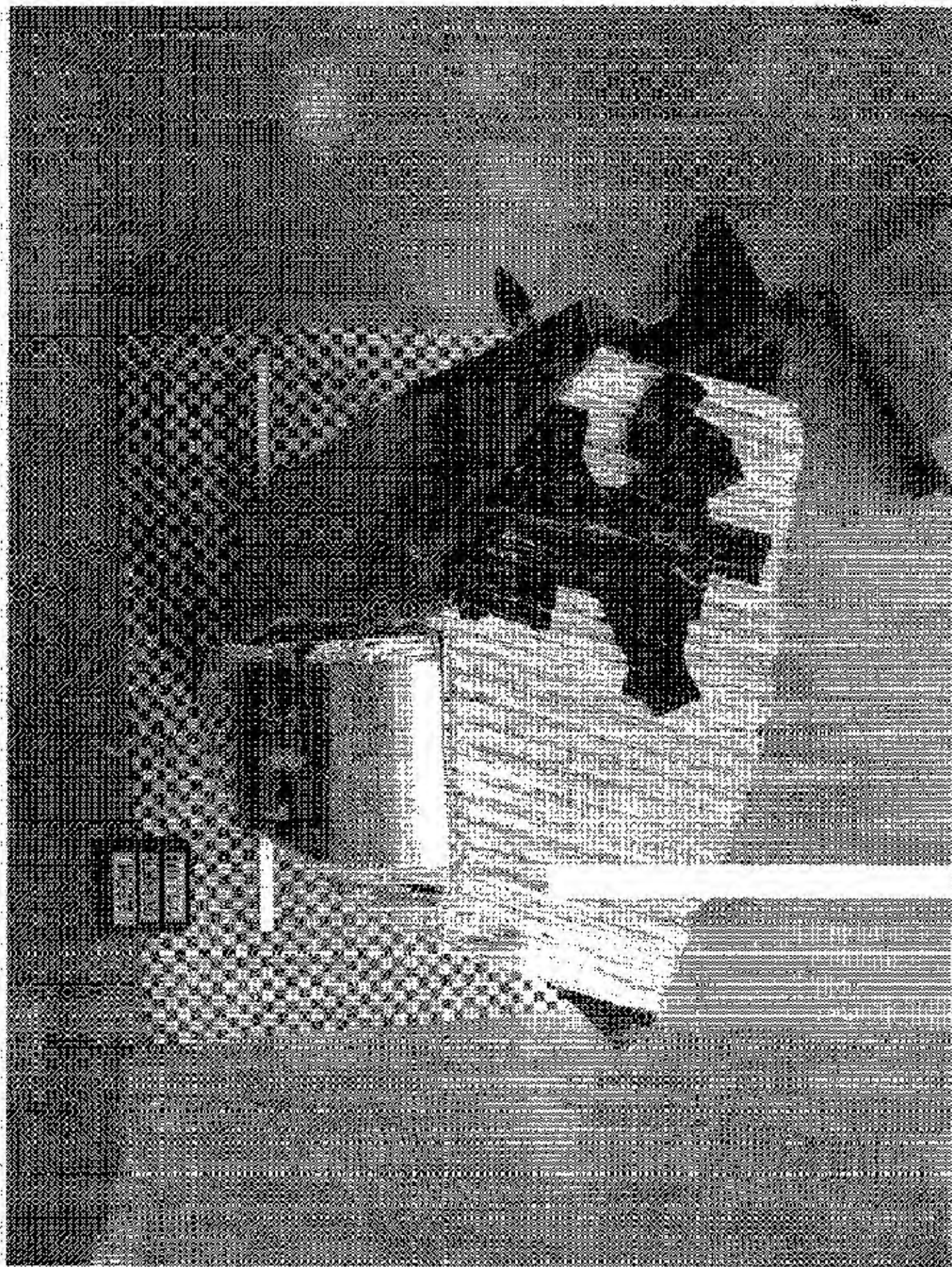


Figure A-10 Post-Test Left Side View of Impactor Face

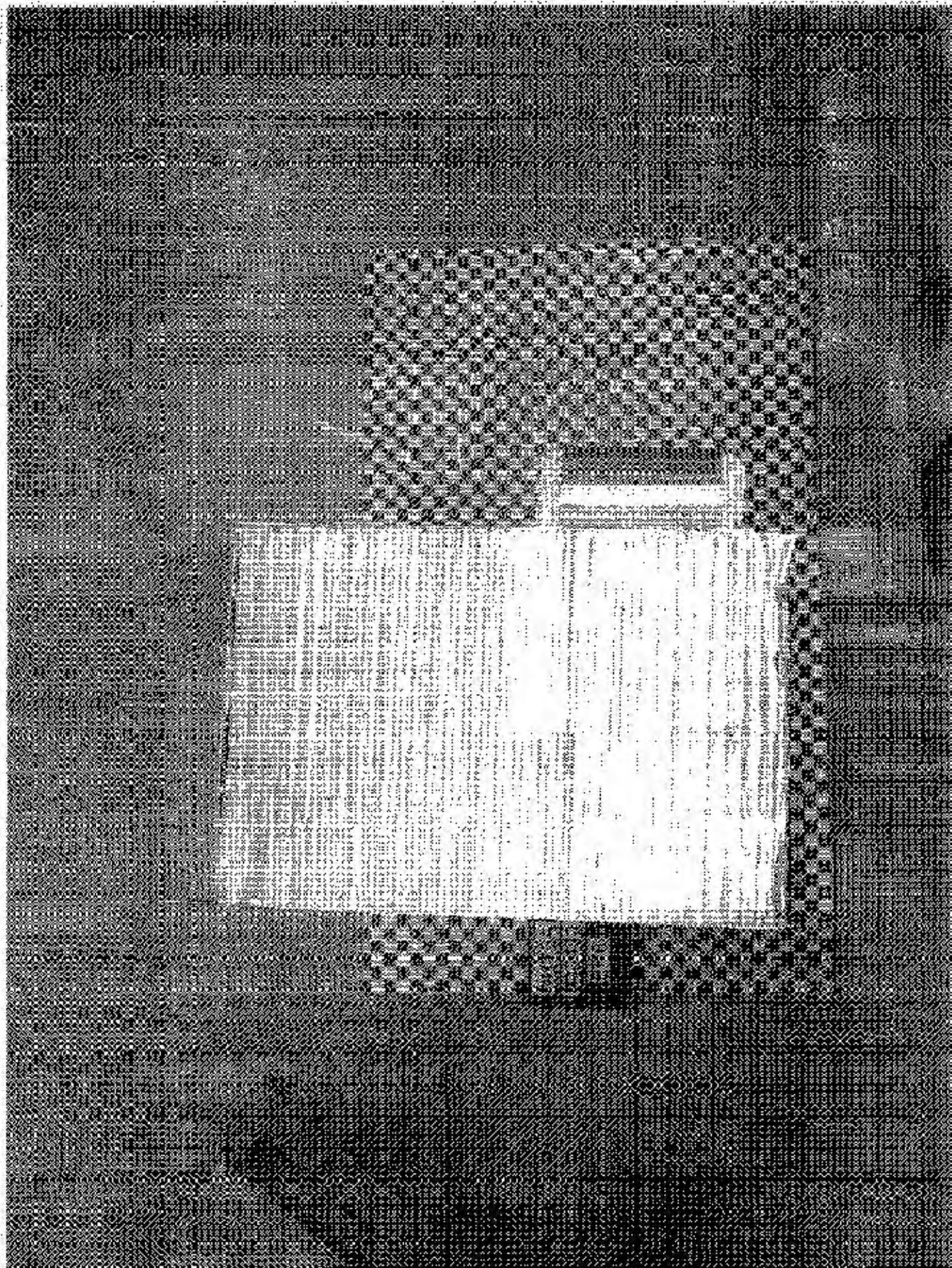


Figure A-11 Pre-Test Right Side View of Impactor Face



Figure A-12 Post-Test Right Side View of Impactor Face

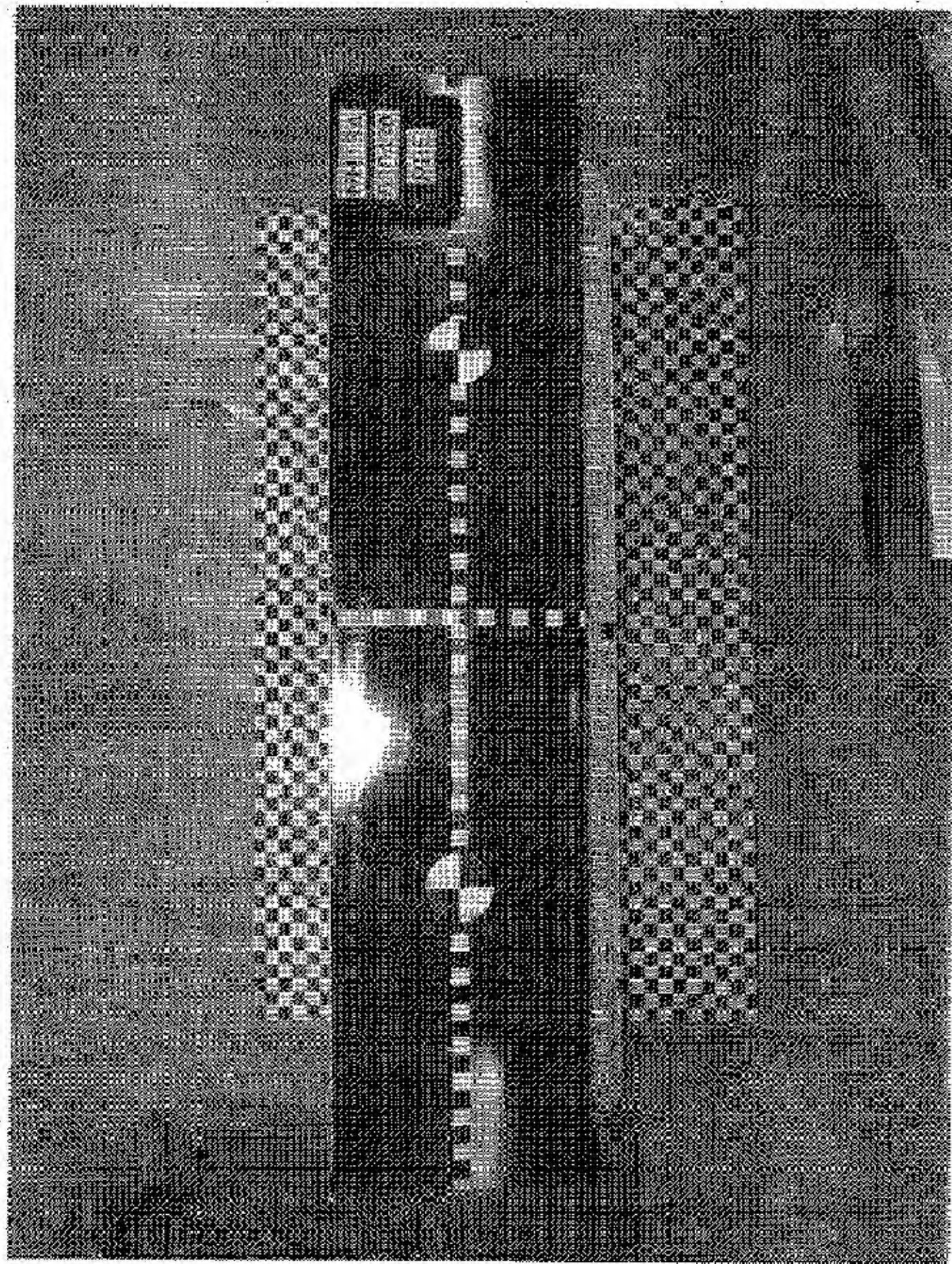


Figure A-13 Pre-Test Top View of Impactor Face

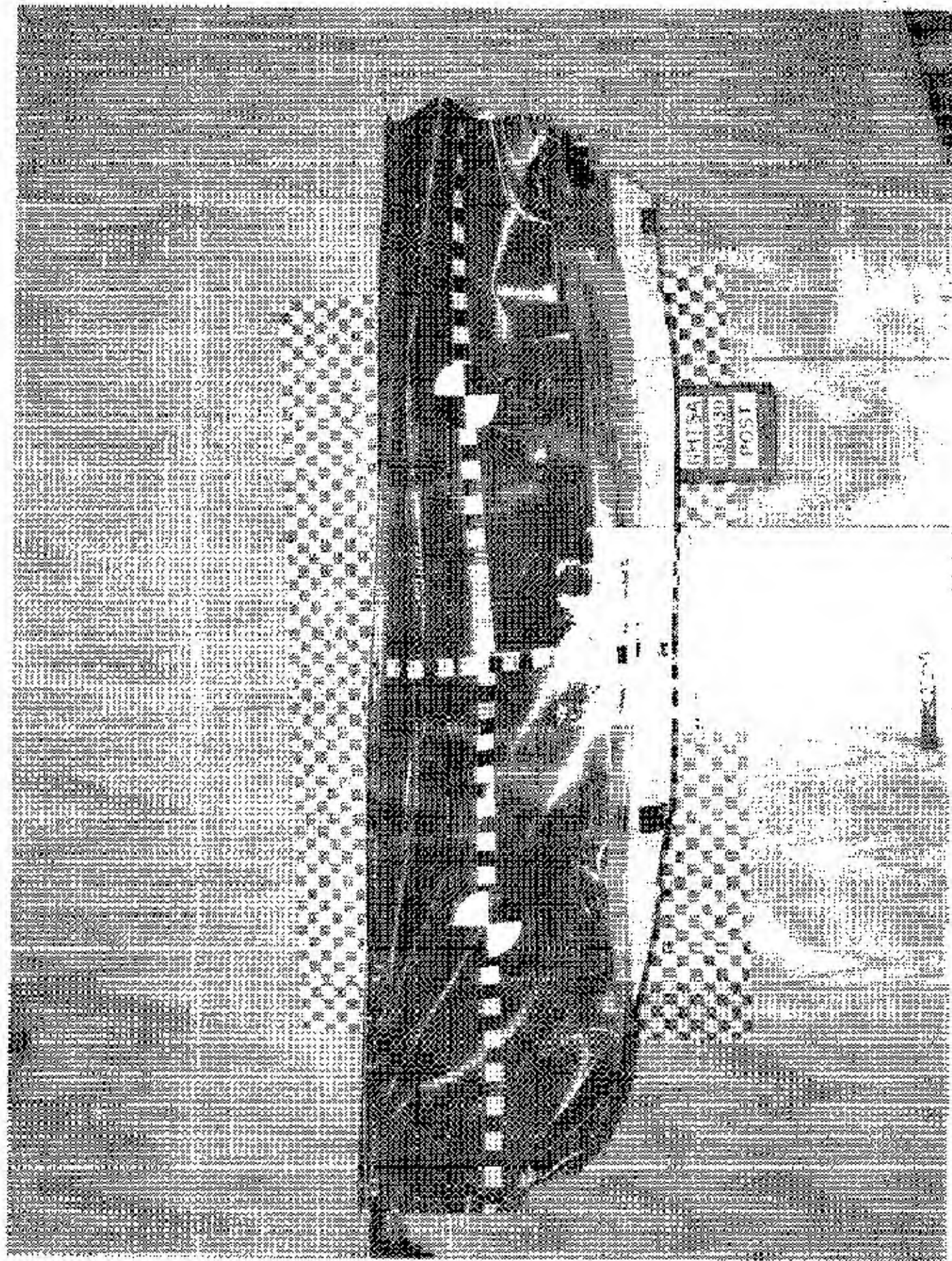


Figure A-i4 Post-Test Top View of Impactor Face

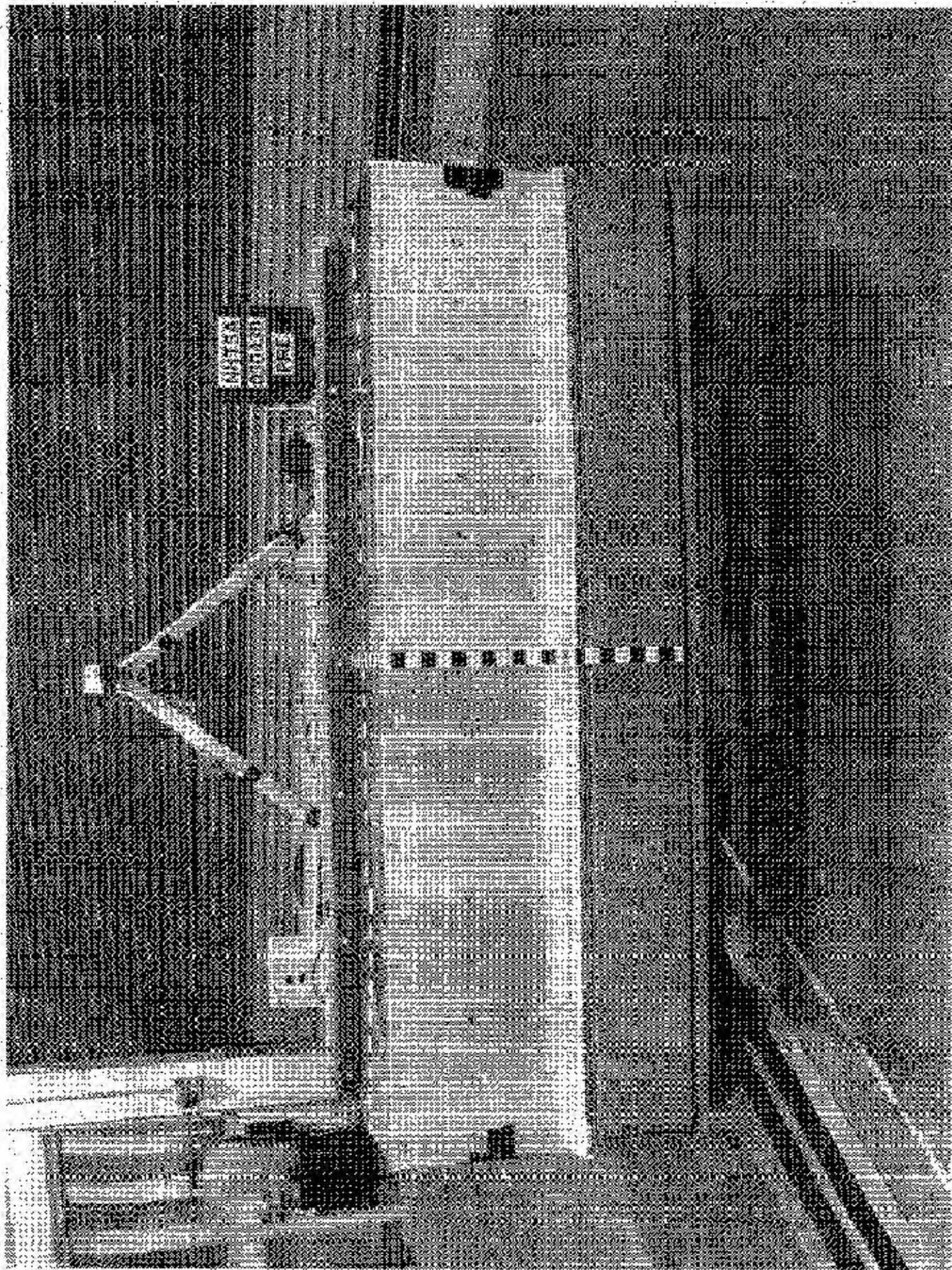


Figure A-15 Pre-Test Frontal View of MDB

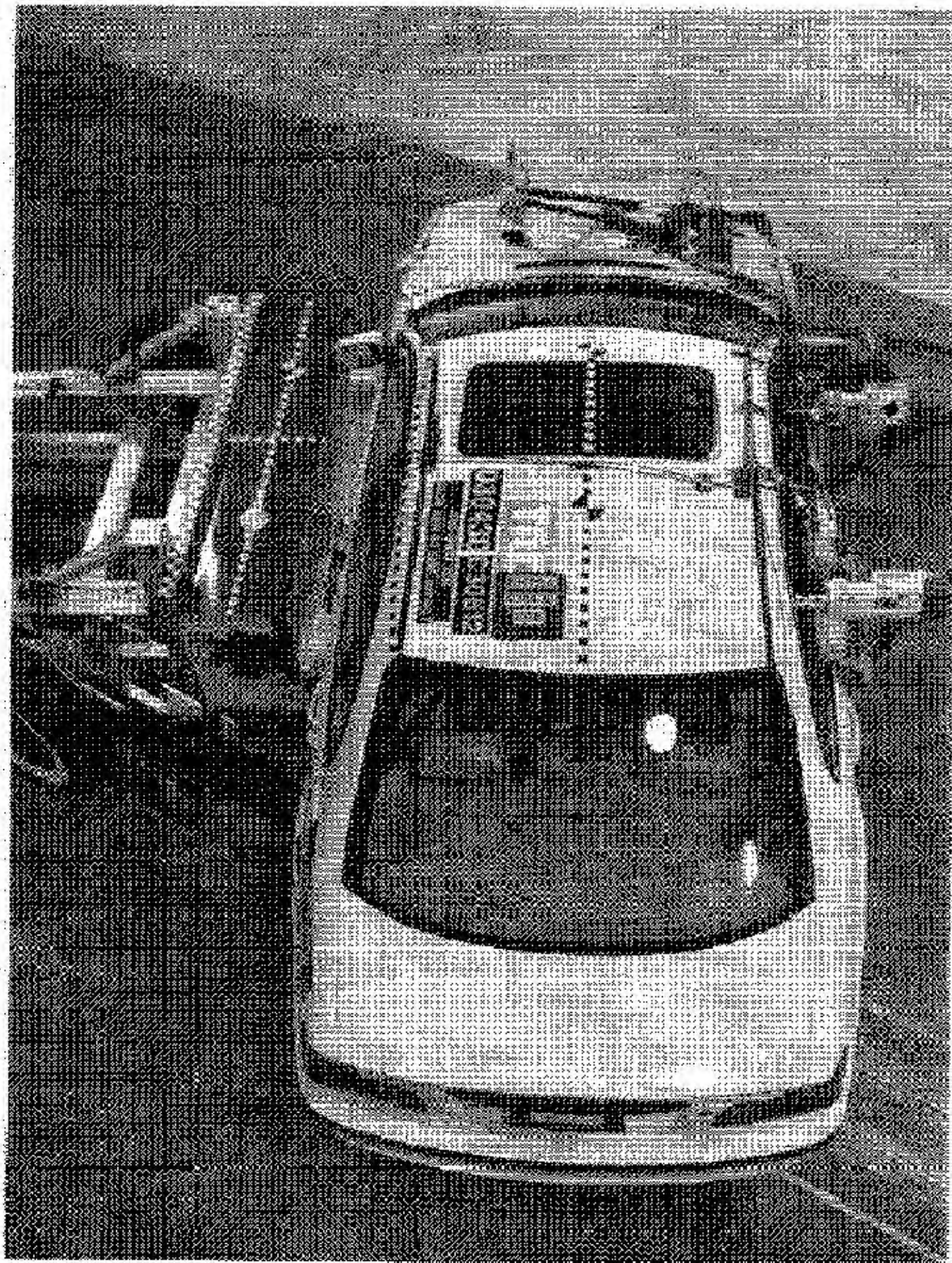


Figure A-16 Pre-Test Overhead View of MDB Aligned with Vehicle

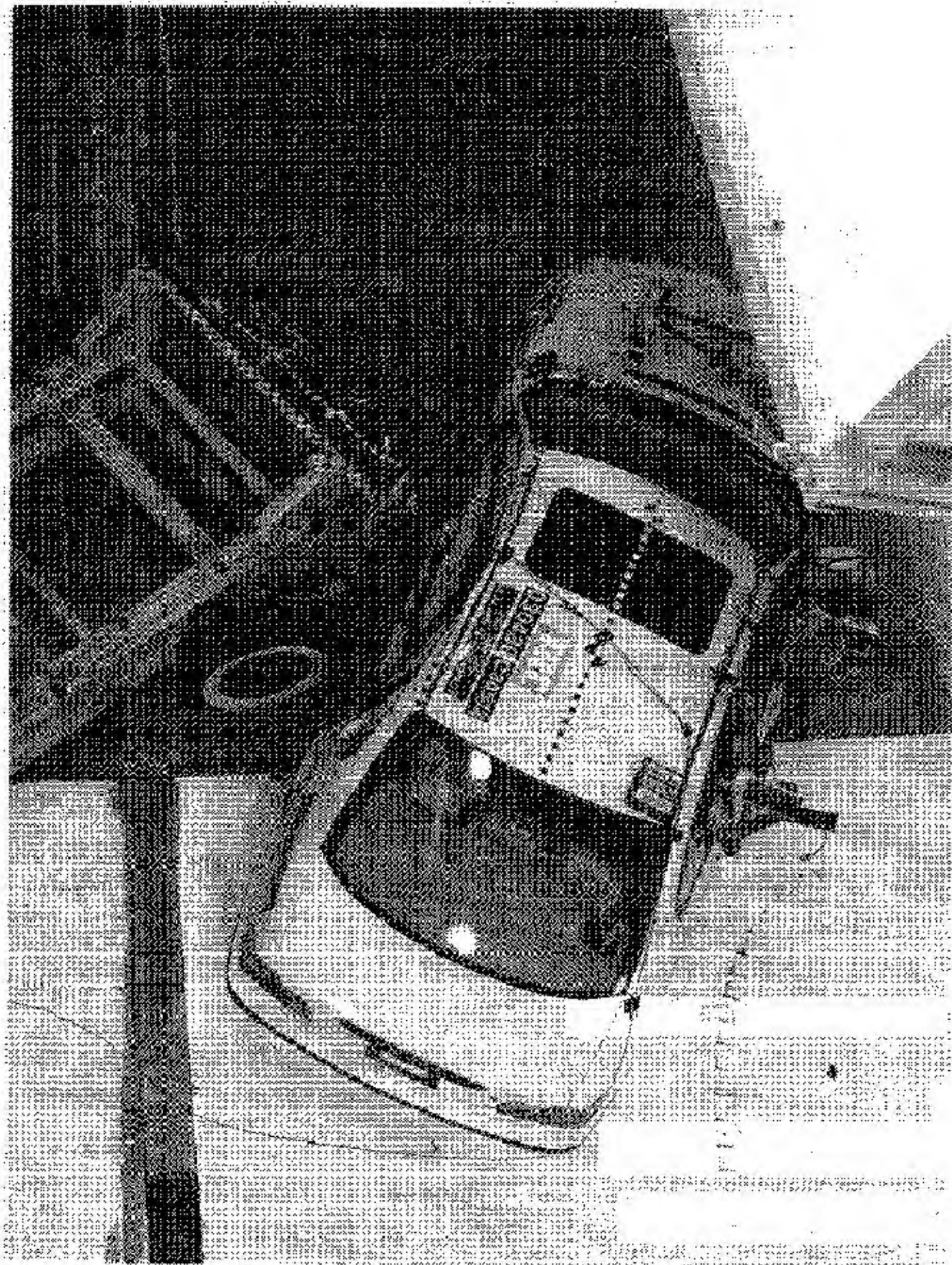


Figure A-17 Post-Test Overhead View of MDB and Vehicle

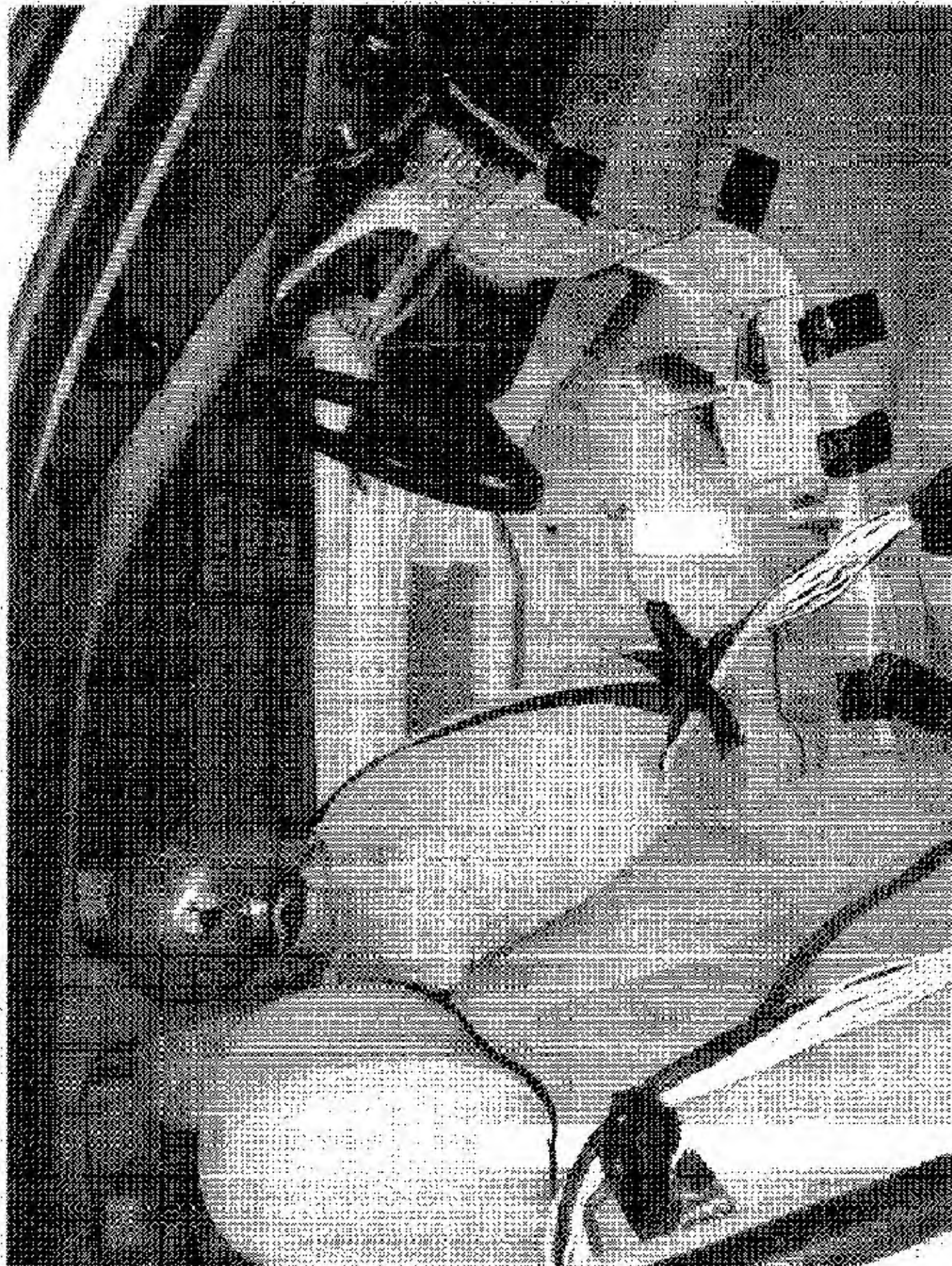


Figure A-18 Pre-Test Right Occupant Compartment View of Front SID

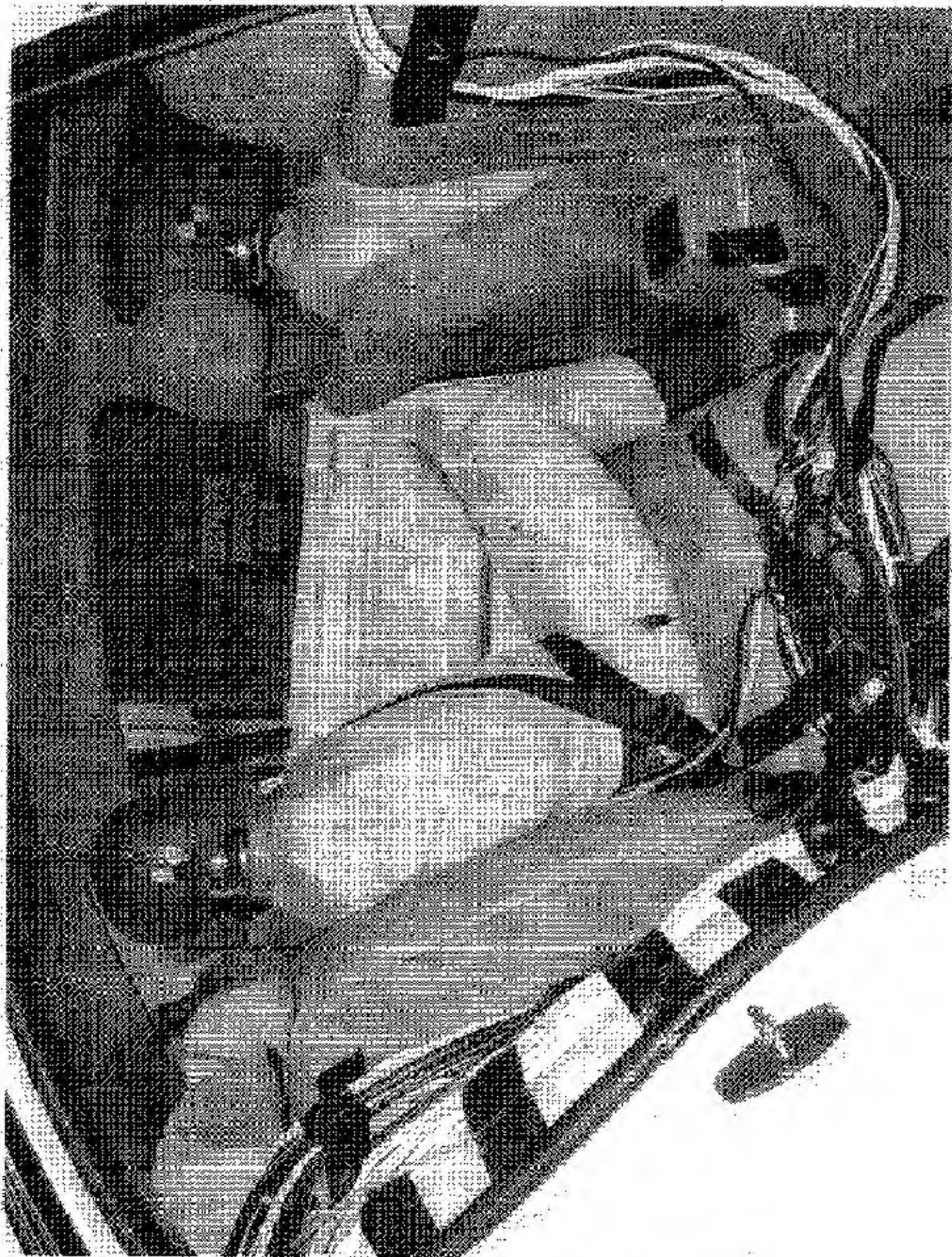


Figure A-19 Pre-Test Right Occupant Compartment View of Rear SID

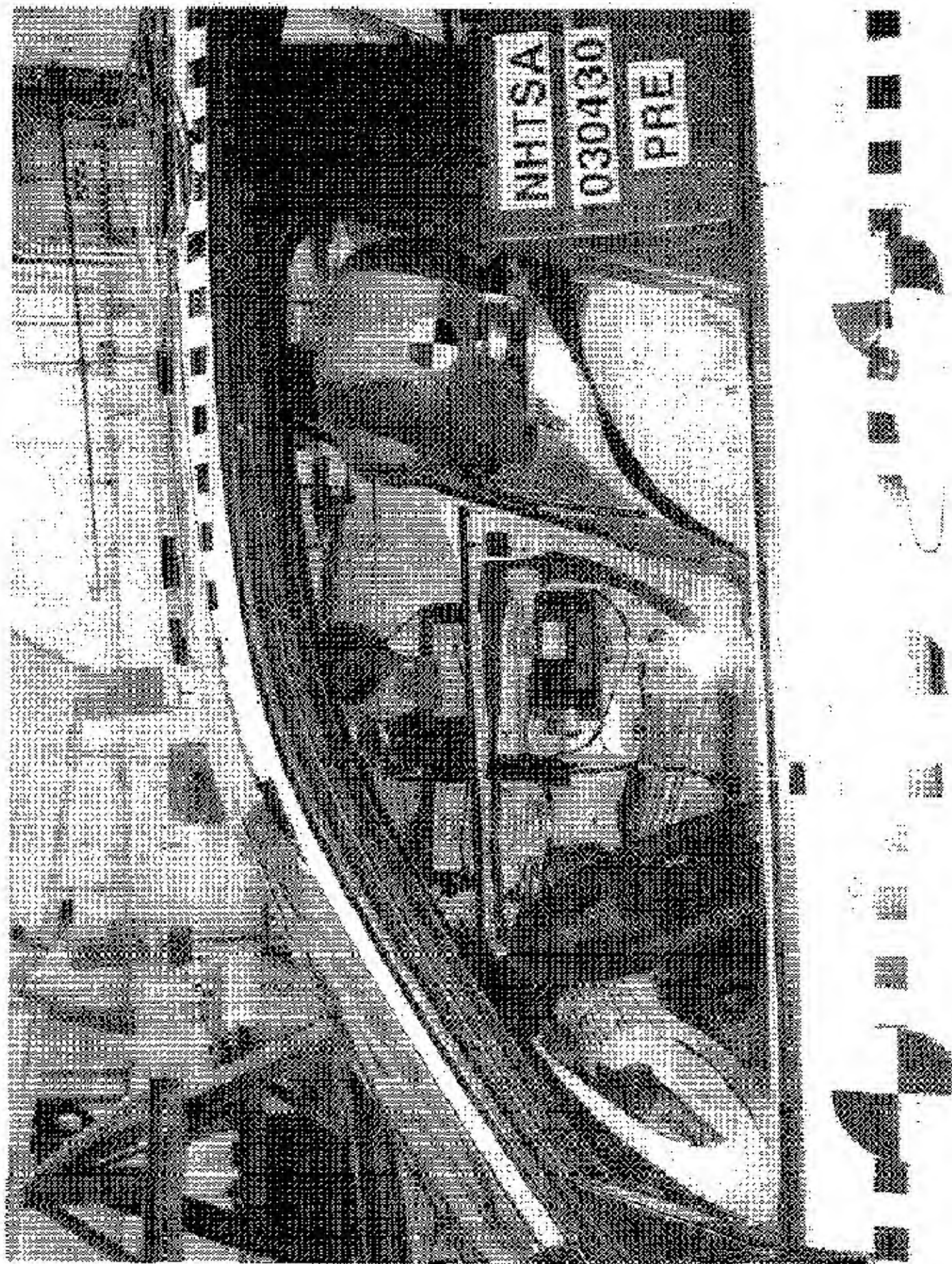


Figure A-20 Pre-Test Left View of Front SID

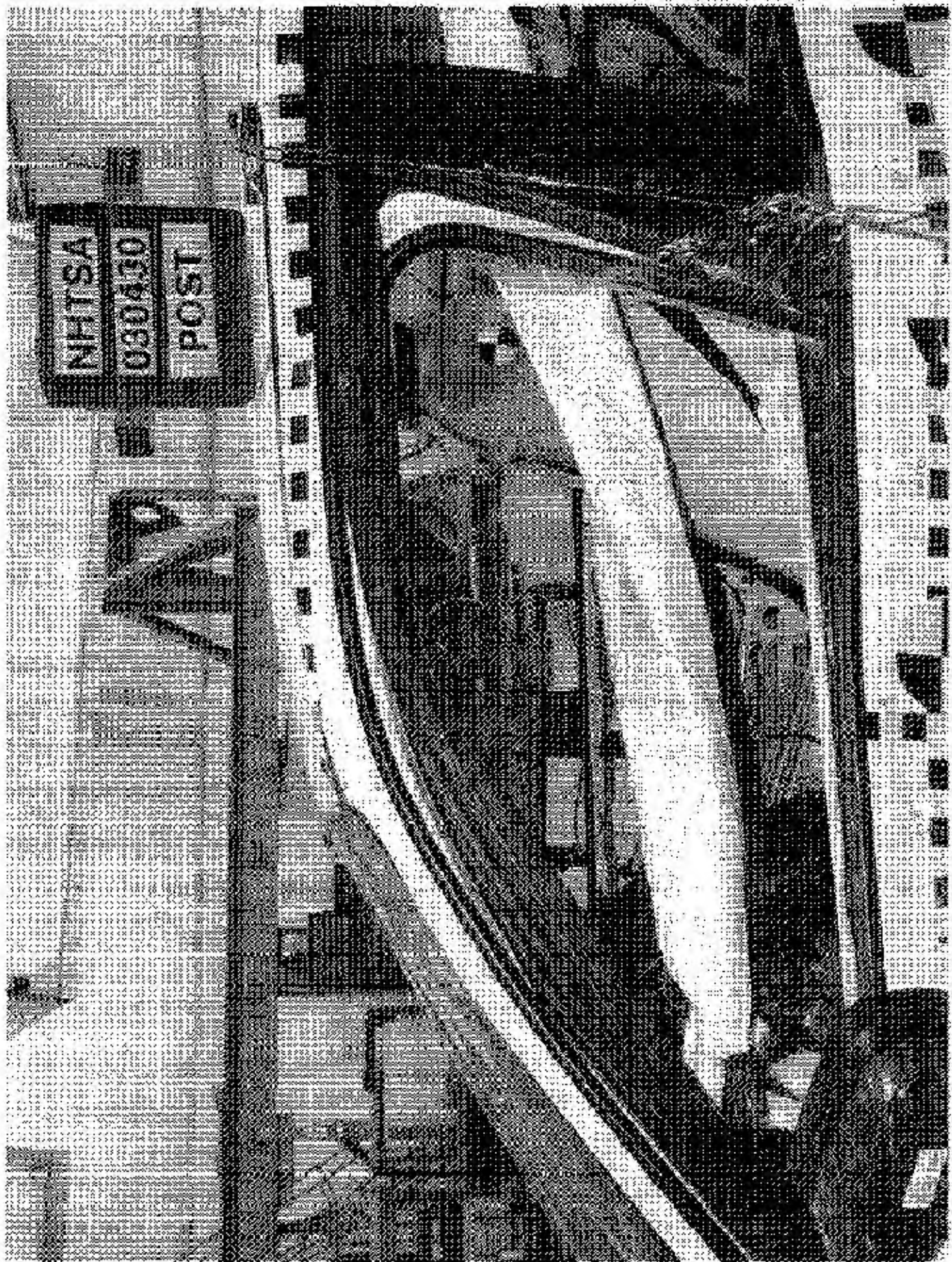


Figure A-21 Post-Test Left View of Front SID

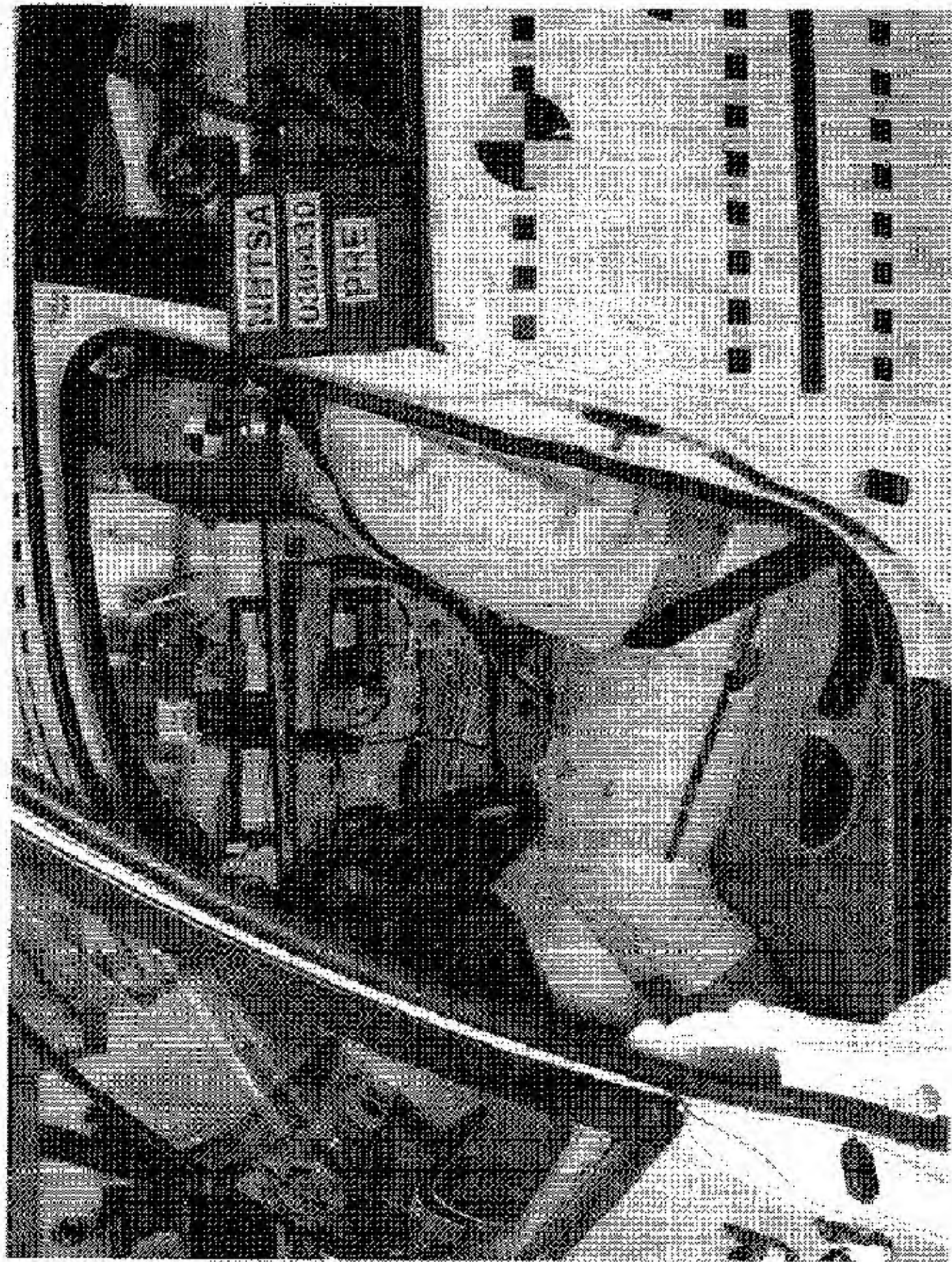


Figure A-22 Pre-Test Left View of Front SID and Belt Position

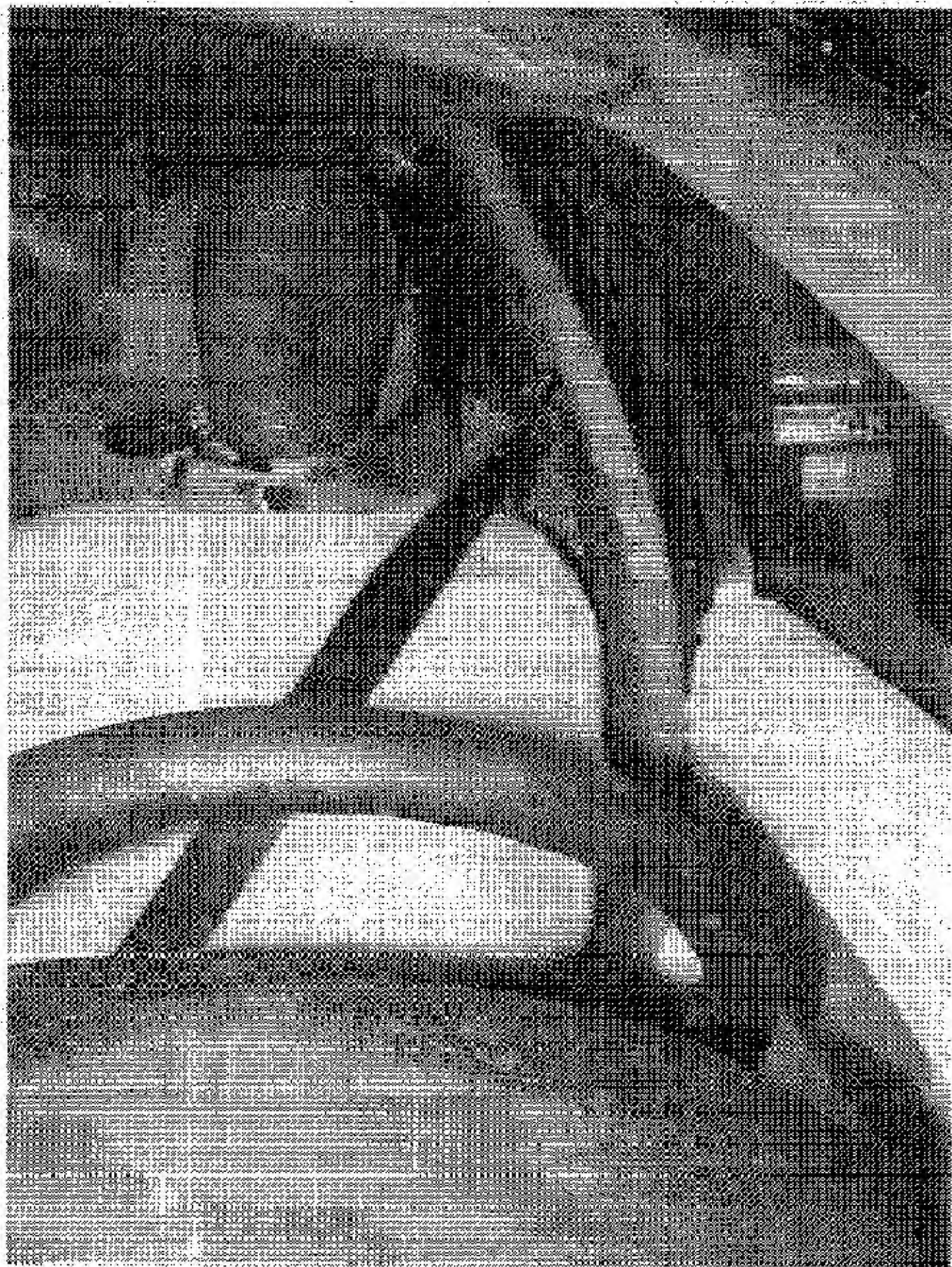


Figure A-23 Pre-Test Left View of Front SID and Door Clearance



Figure A-24 Post-Test Left View of Front SID and Door Clearance

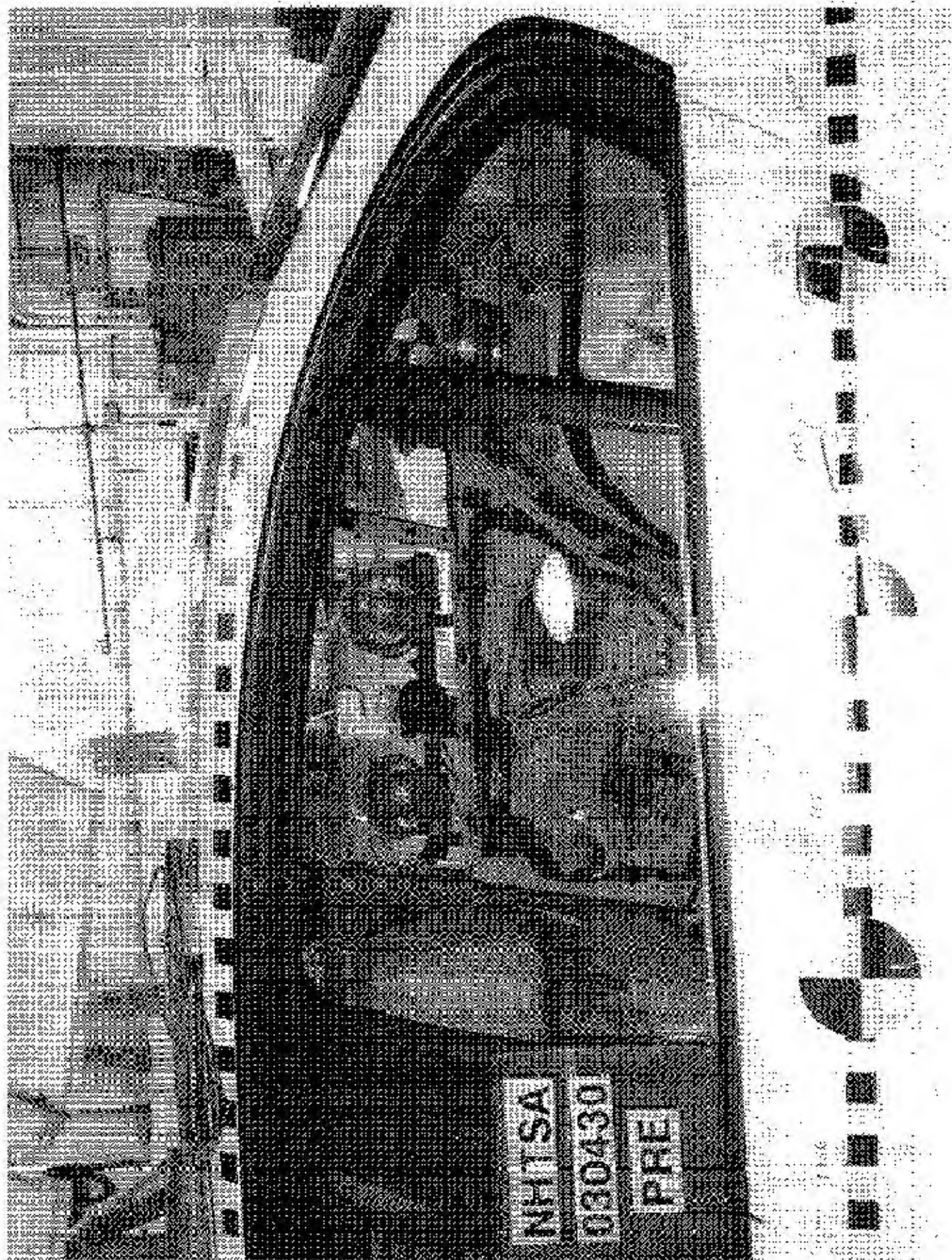


Figure A-25 Pre-Test Left View of Rear SHD

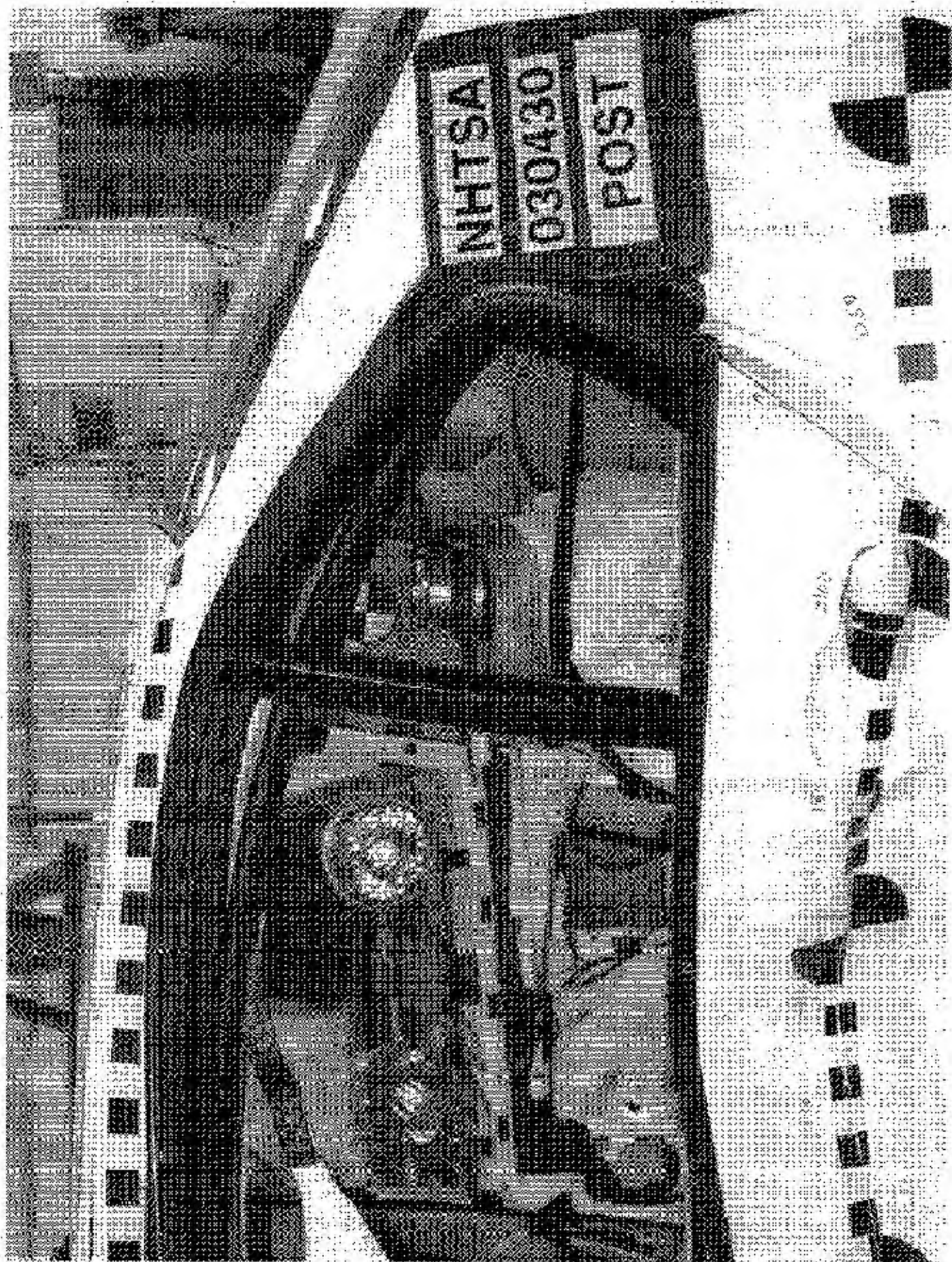


Figure A-26 Post-Test Left View of Rear SID

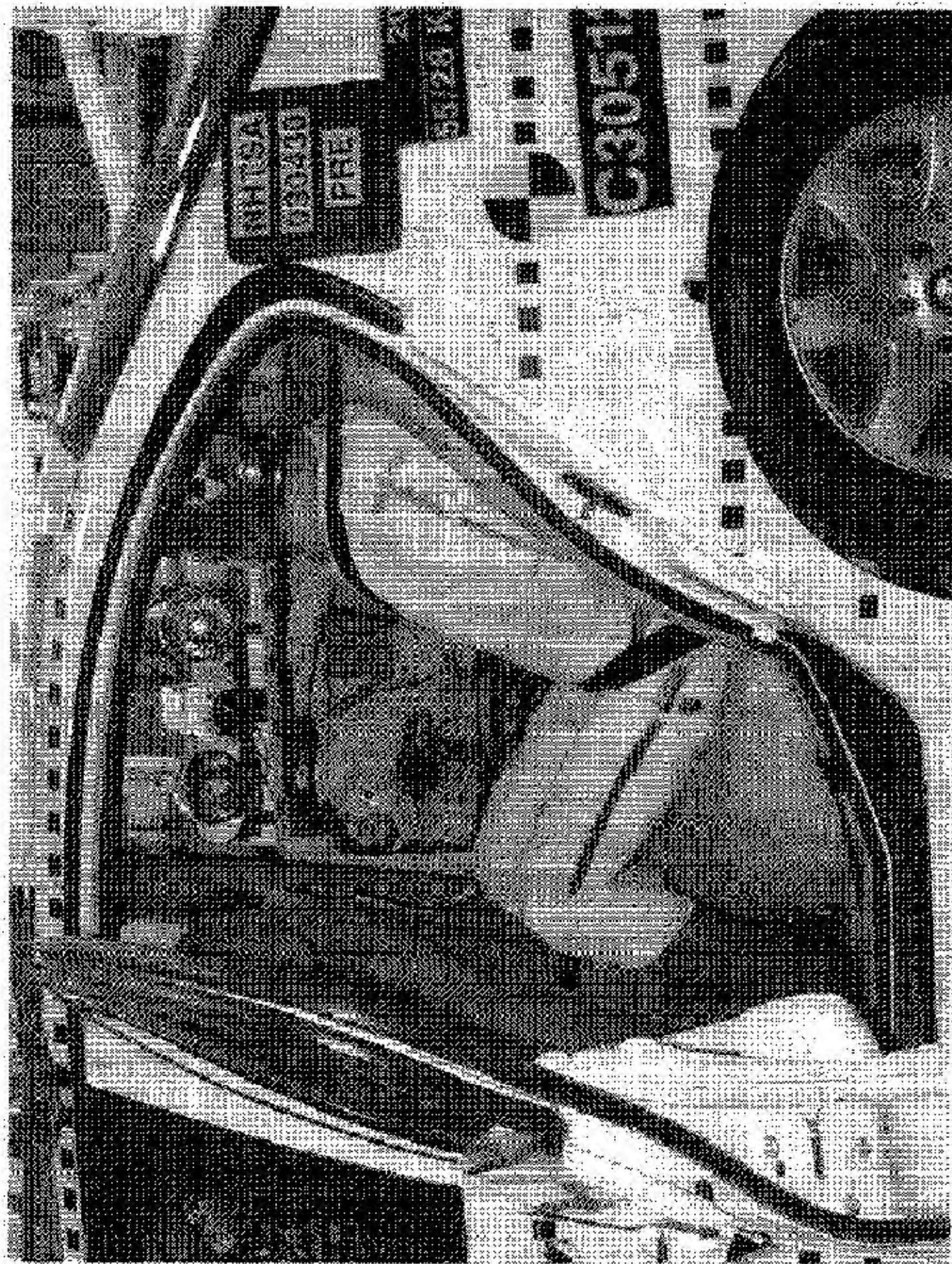


Figure A-27 Pre-Test Left of Rear SID and Belt Position



Figure A-28 Pre-Test Left View of Rear SID and Door Clearance



Figure A-29 Post-Test Left View of Rear SID and Door Clearance

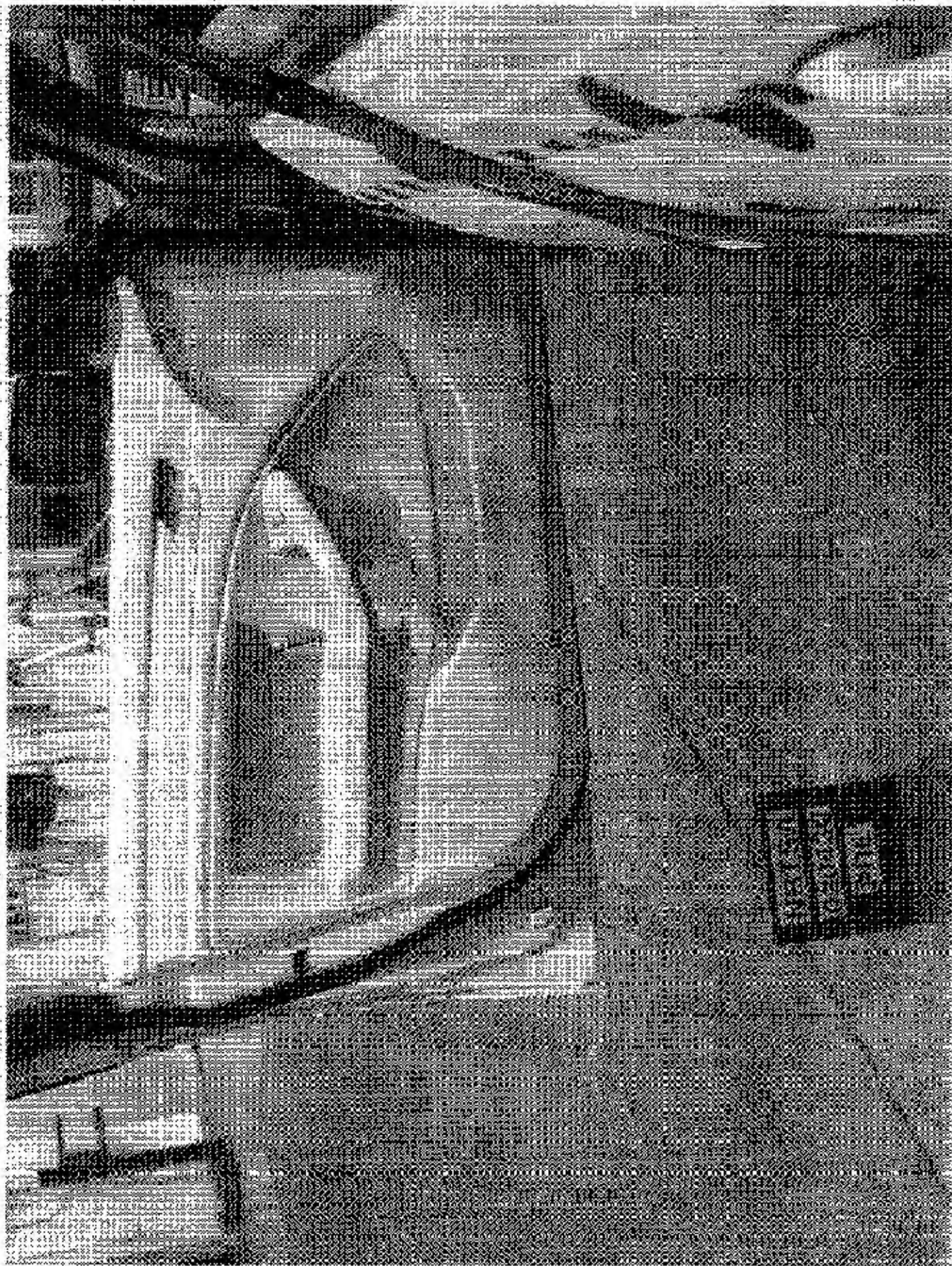


Figure A-30 Pre-Test Interior of Front Door



Figure A-31 Post-Test Interior of Front Door Showing SID Impact Locations

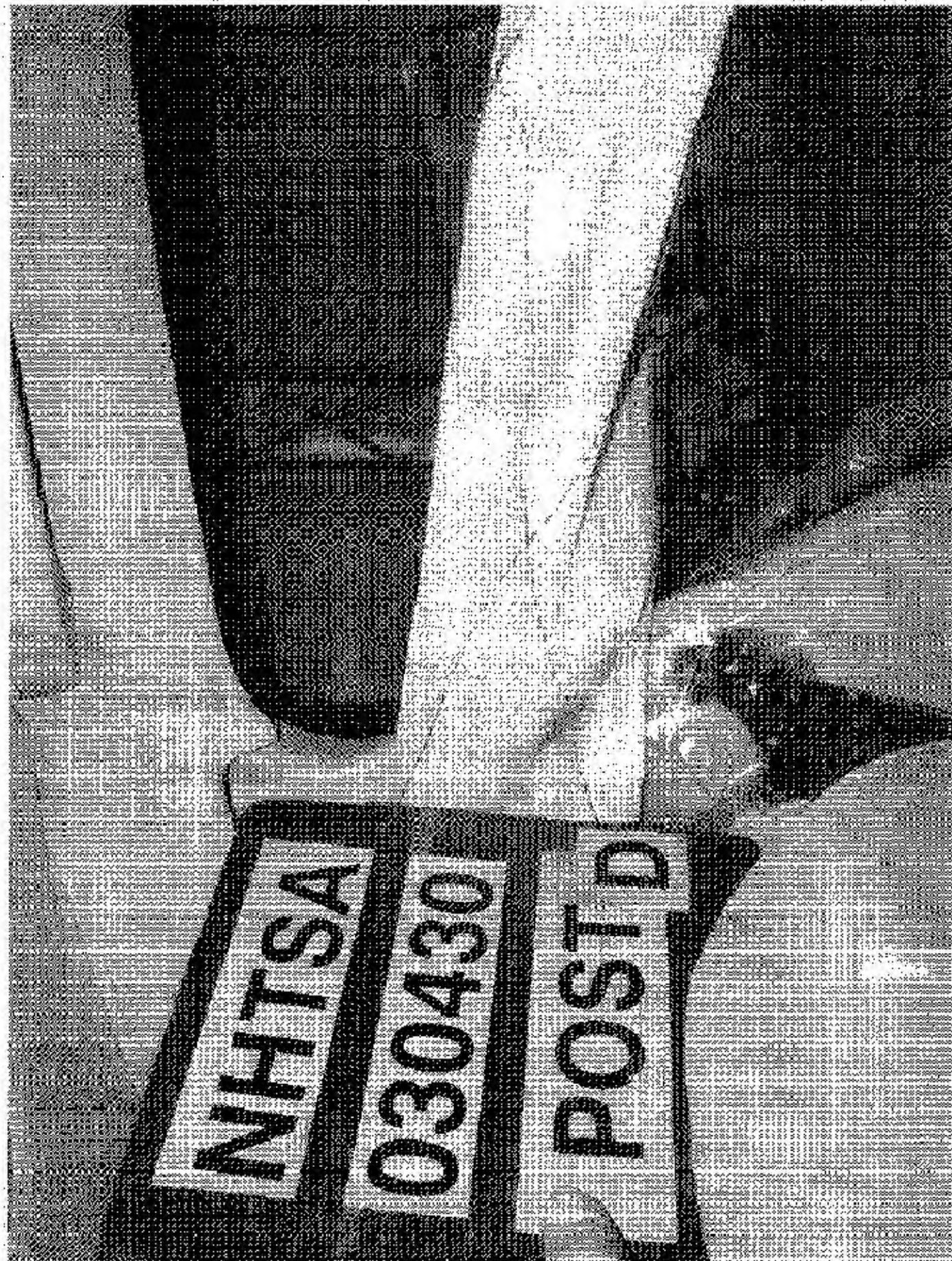


Figure A-32 Post-Test Front SID Contact - View 1

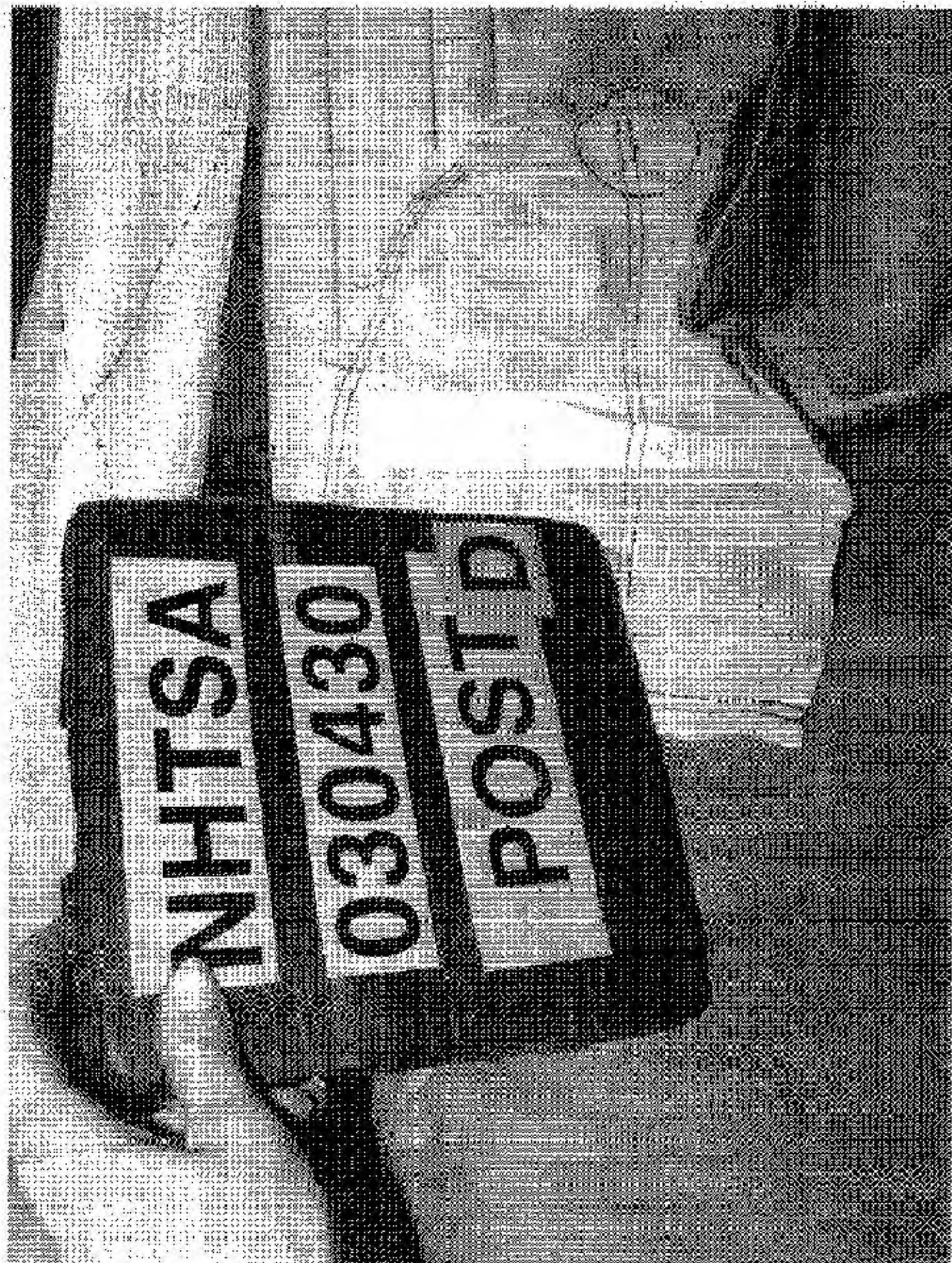


Figure A-39 Post-Test Front SID Contact - View 2



Figure A-34 Post-Test Front SID Contact - View 3

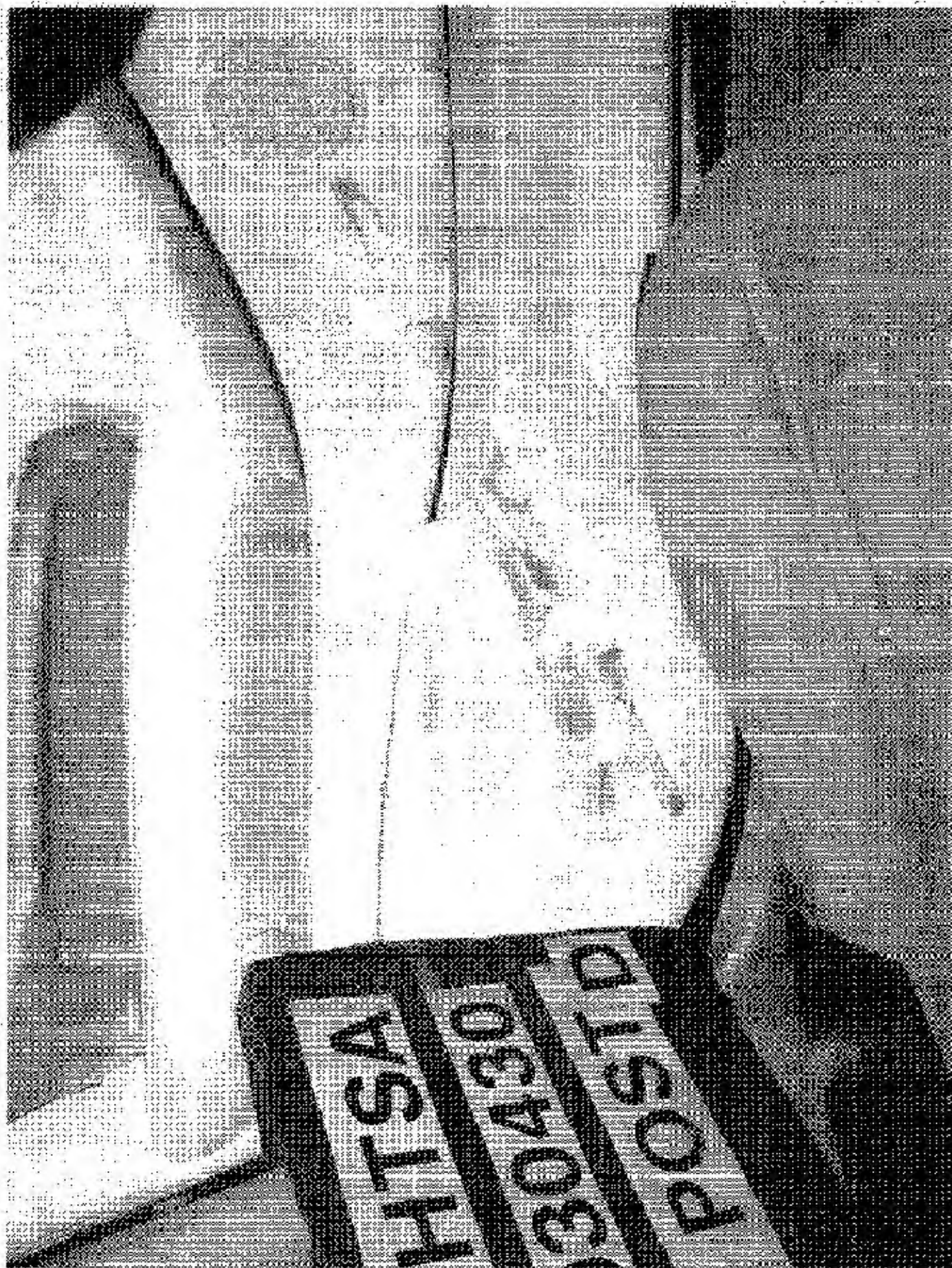


Figure A-35 Post-Test Front SID Contact - View 4



Figure A-36 Post-Test Front SID Contact - View 5



Figure A-37 Pre-Test Interior of Rear Panel

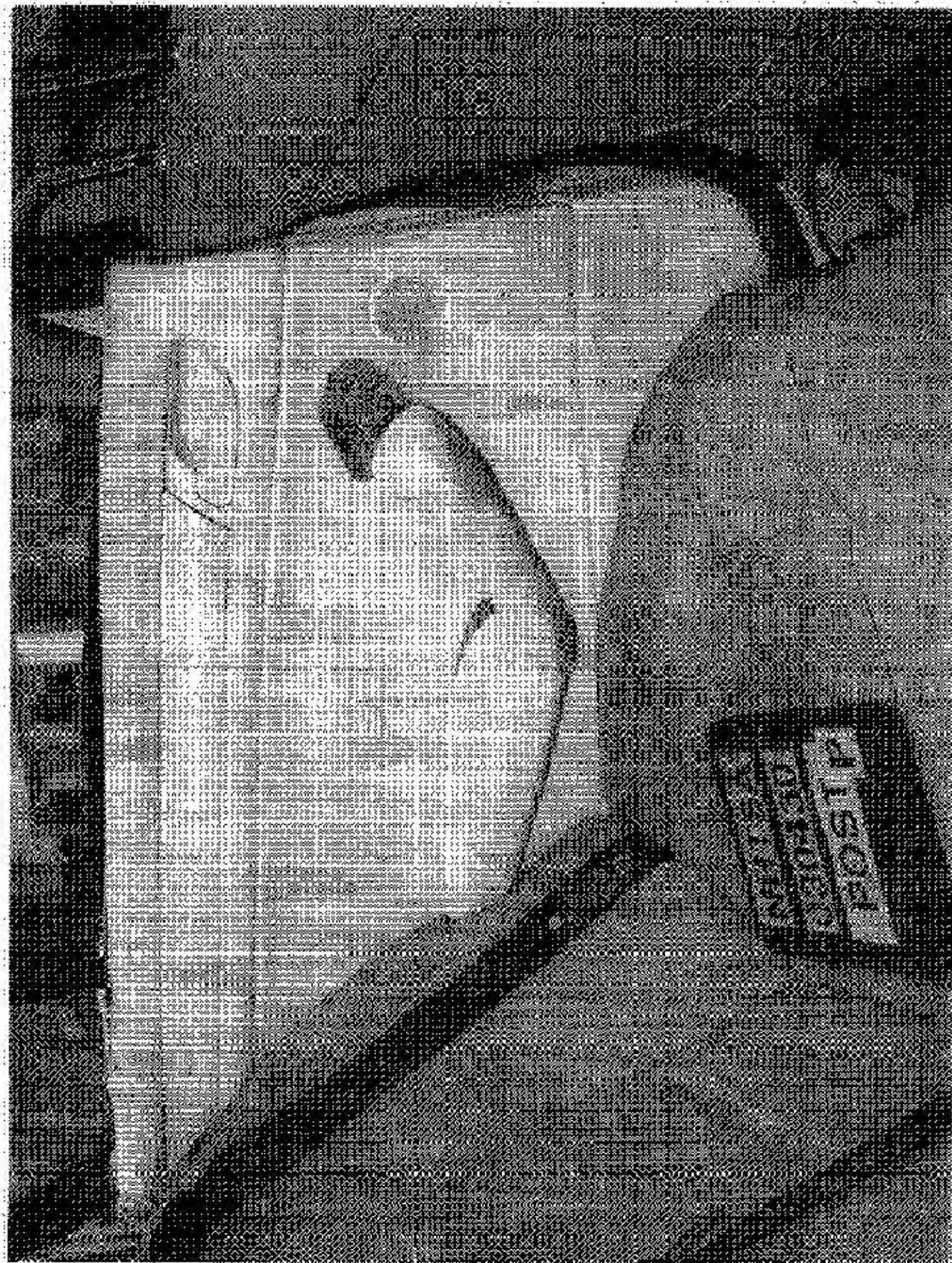


Figure A-38 Post-Test Interior of Rear Panel Showing SID Impact Locations



Figure A-39 Post-Test Rear SID Contact - View 1



Figure A-40 Post-Test Rear SID Contact - View 2



Figure A-41 Post-Test Rear SID Contact - View 3

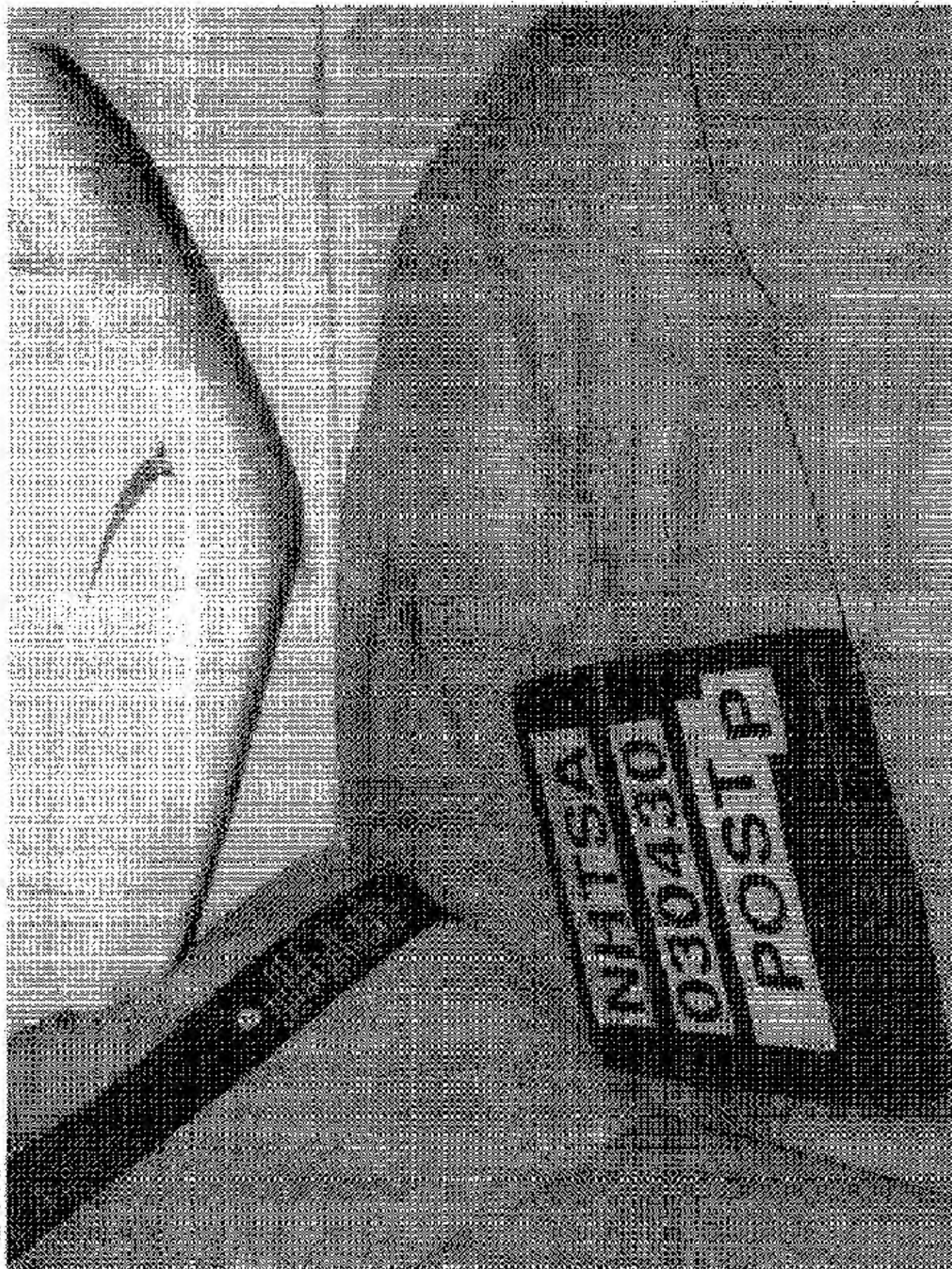


Figure A-42 Post-Test Rear SID Contact - View 4

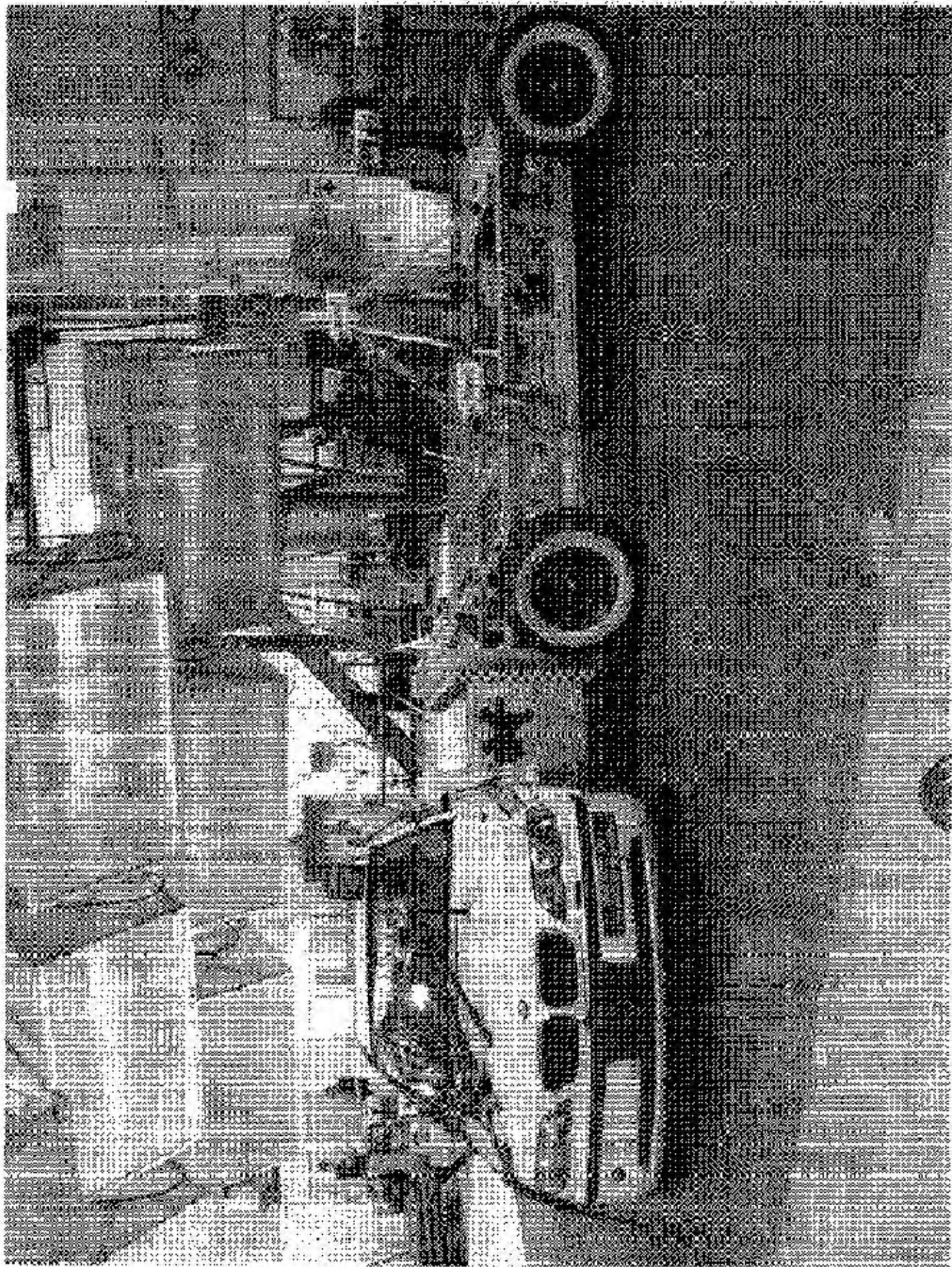


Figure A-45 Pre-Test Left Side View of MDB With Impactor Face in Position

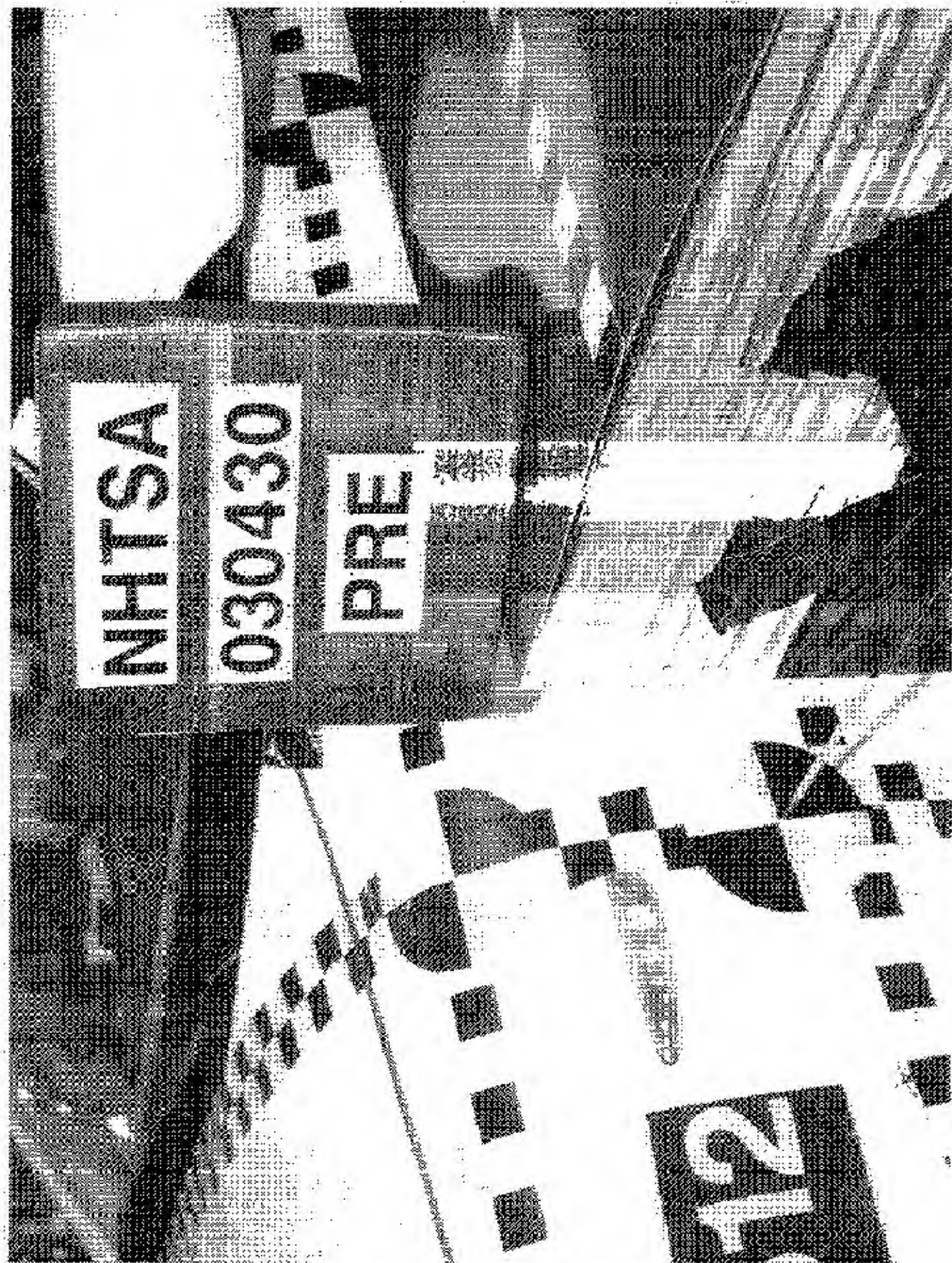


Figure A-44 Pre-Test Primary Impact Point View

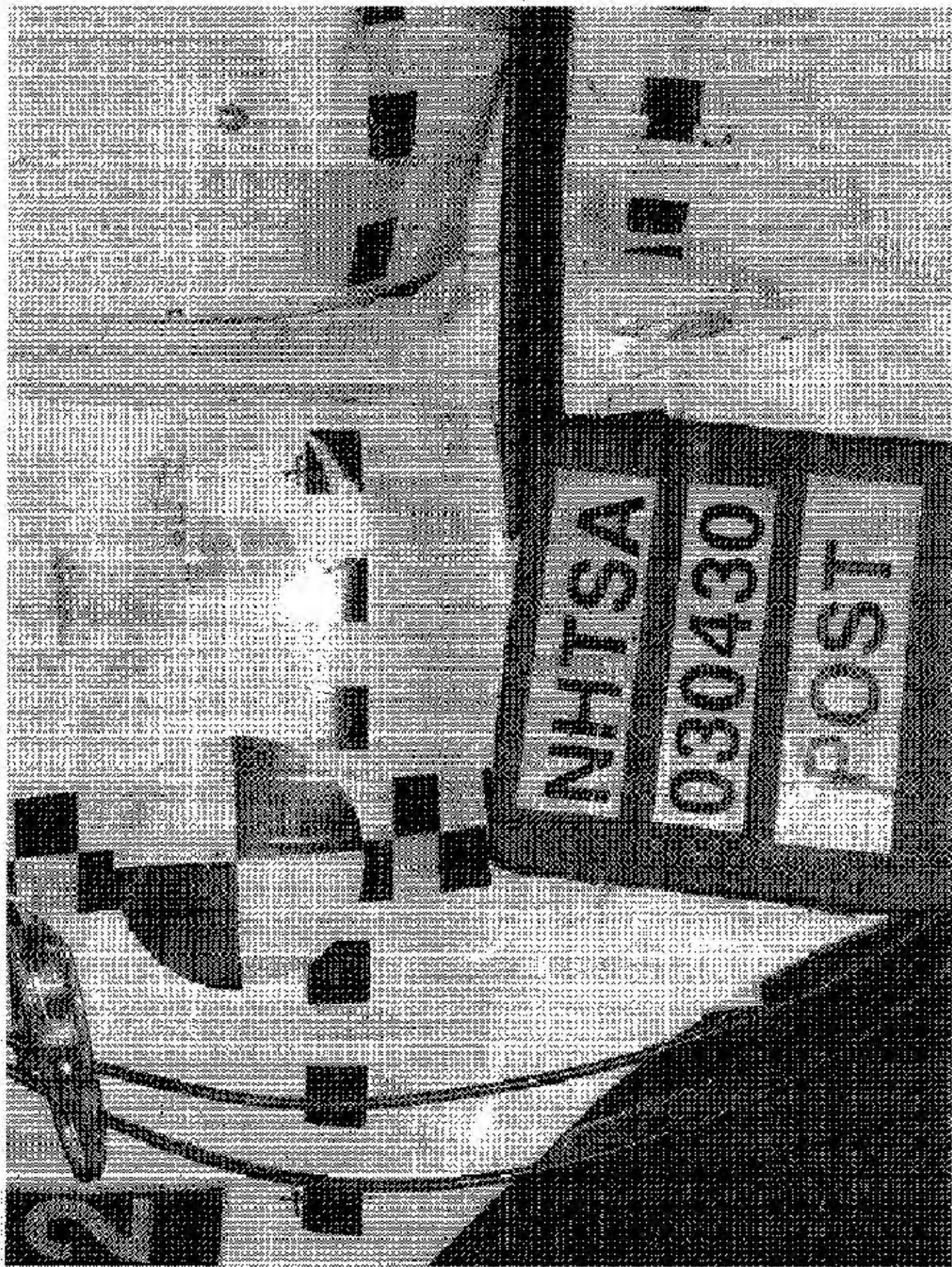


Figure A-45 Post-Test Primary Impact Point View

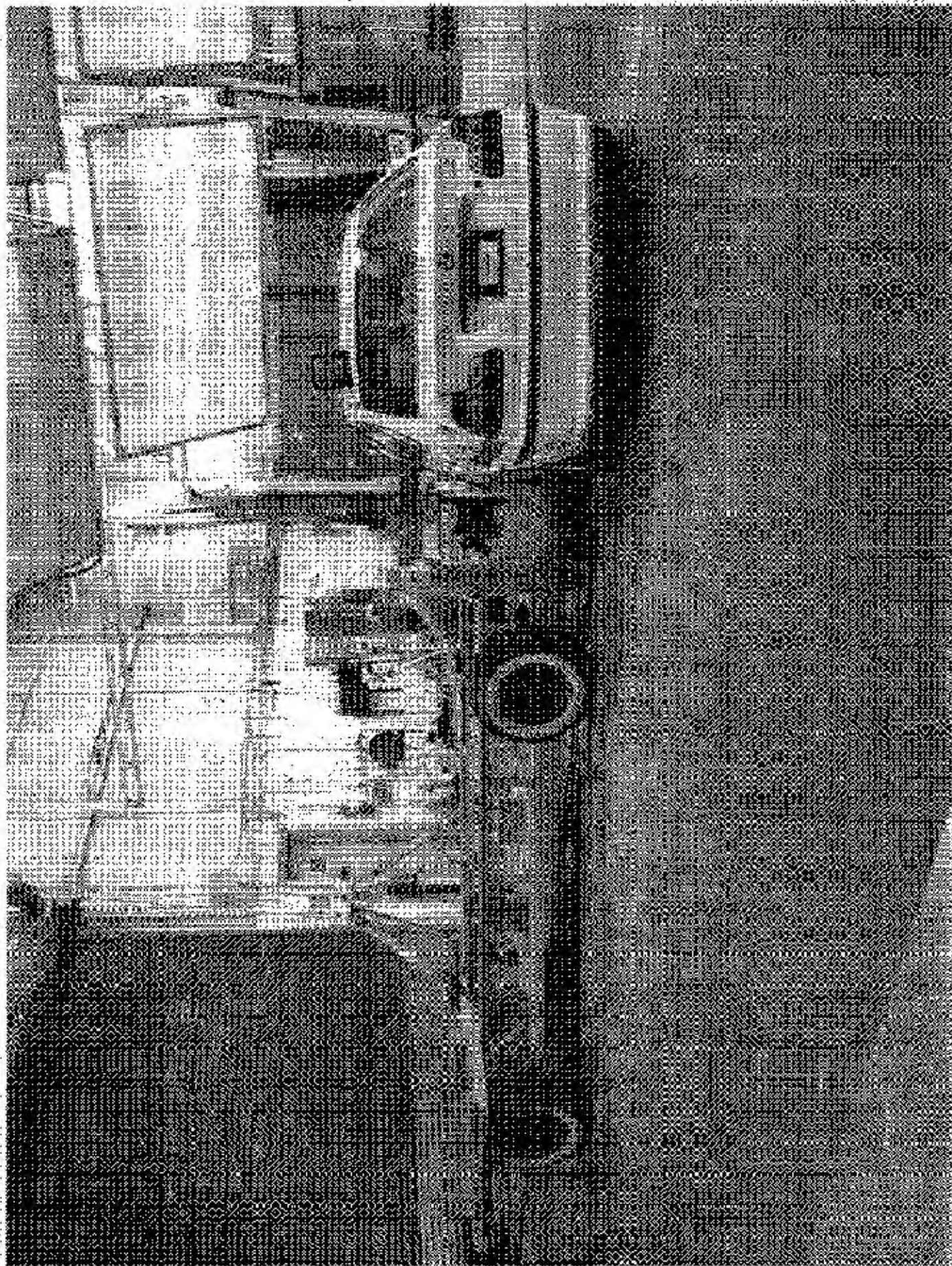


Figure A-46 Pre-Test Right Side View of MDB With Impactor Face in Position



Figure A-47 Pre-Test Secondary Impact Point View



Figure A-48 Post-Test Secondary Impact Point View

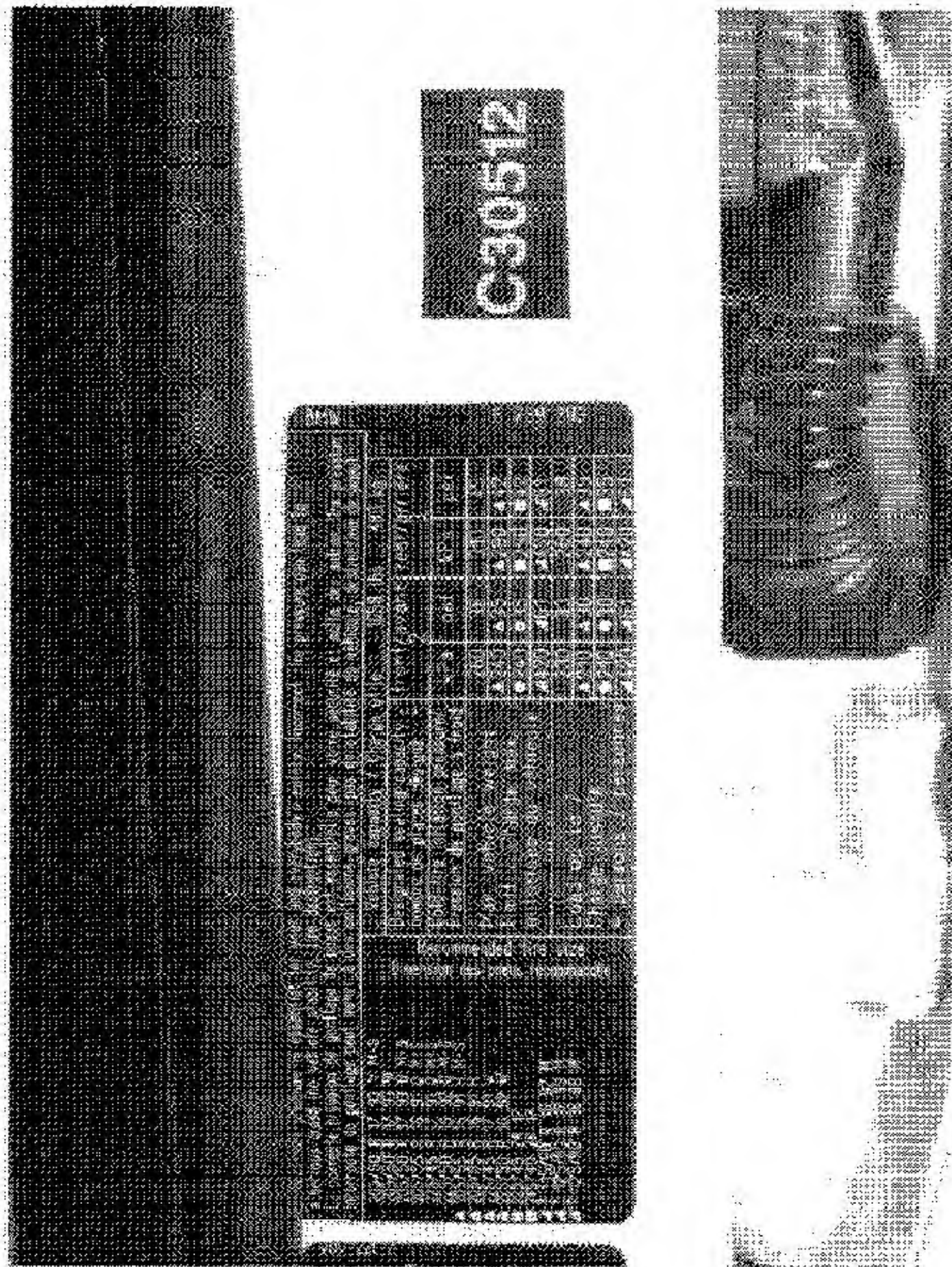


Figure A-50 Pre-Test Vehicle Recommended Tire Pressure Label View

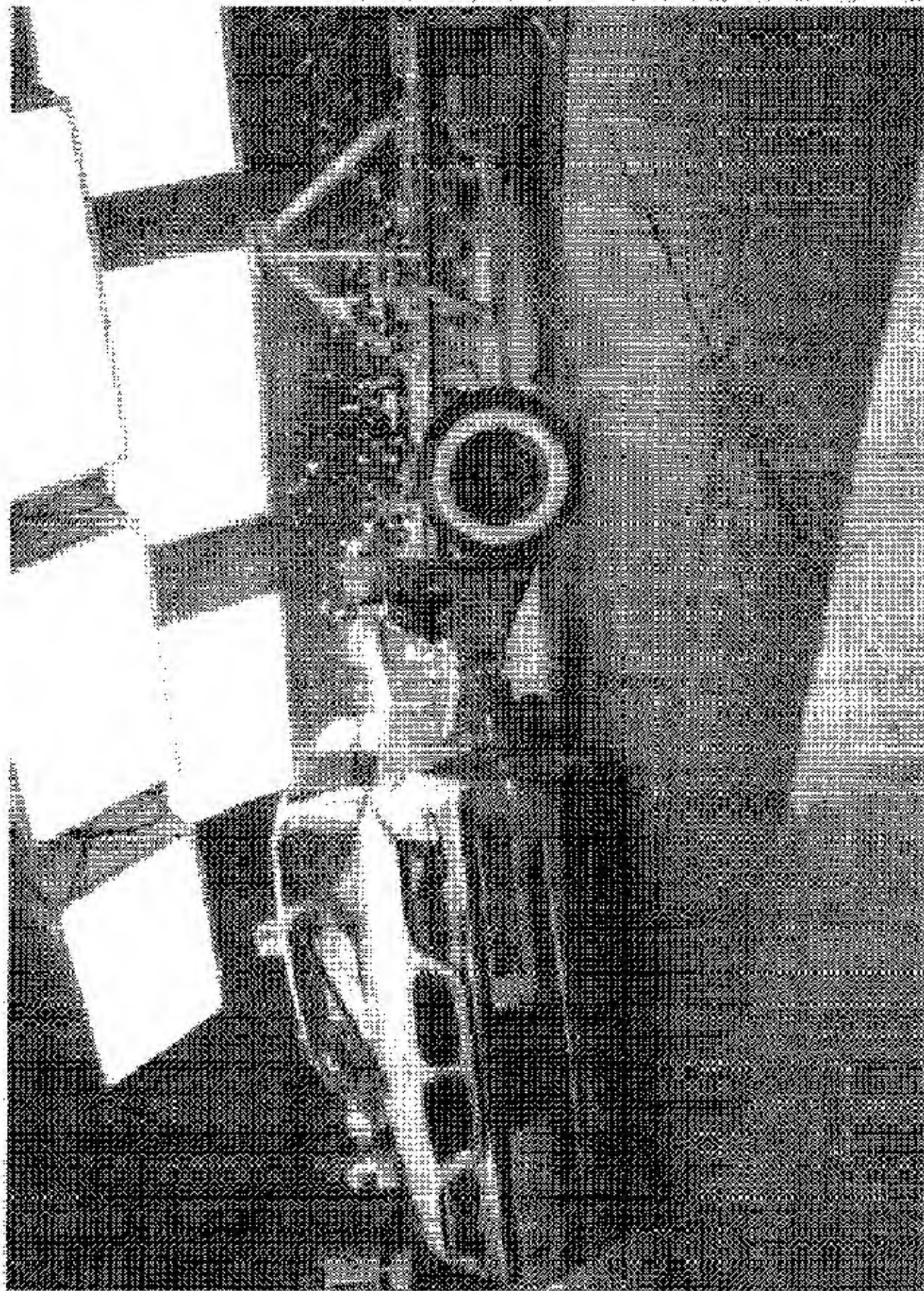


Figure A-51 Impact Event

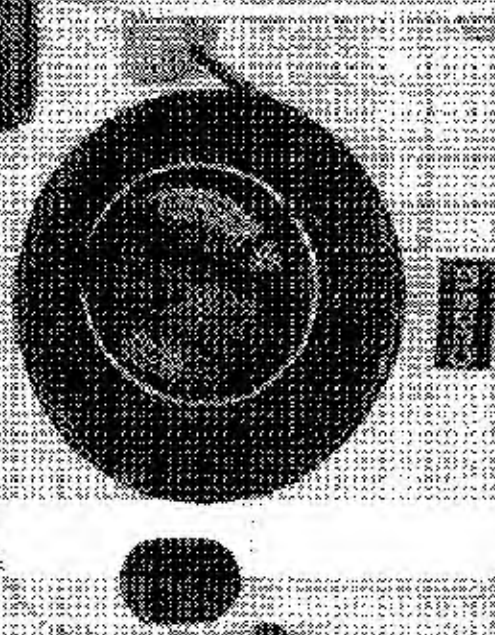


Figure A-52 Pre-Test Fuel Cap

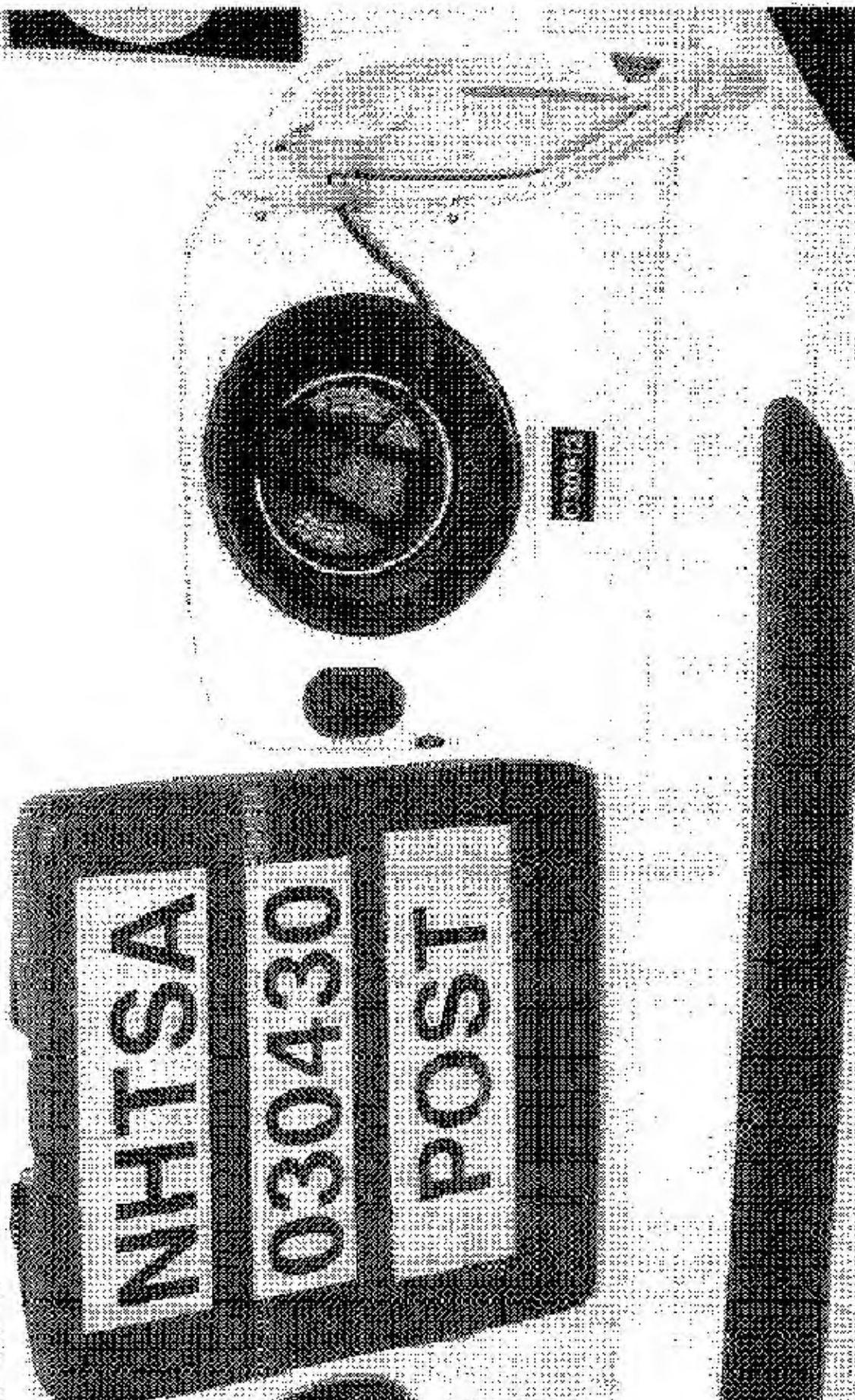


Figure A-53 Post-Test Fuel Cap

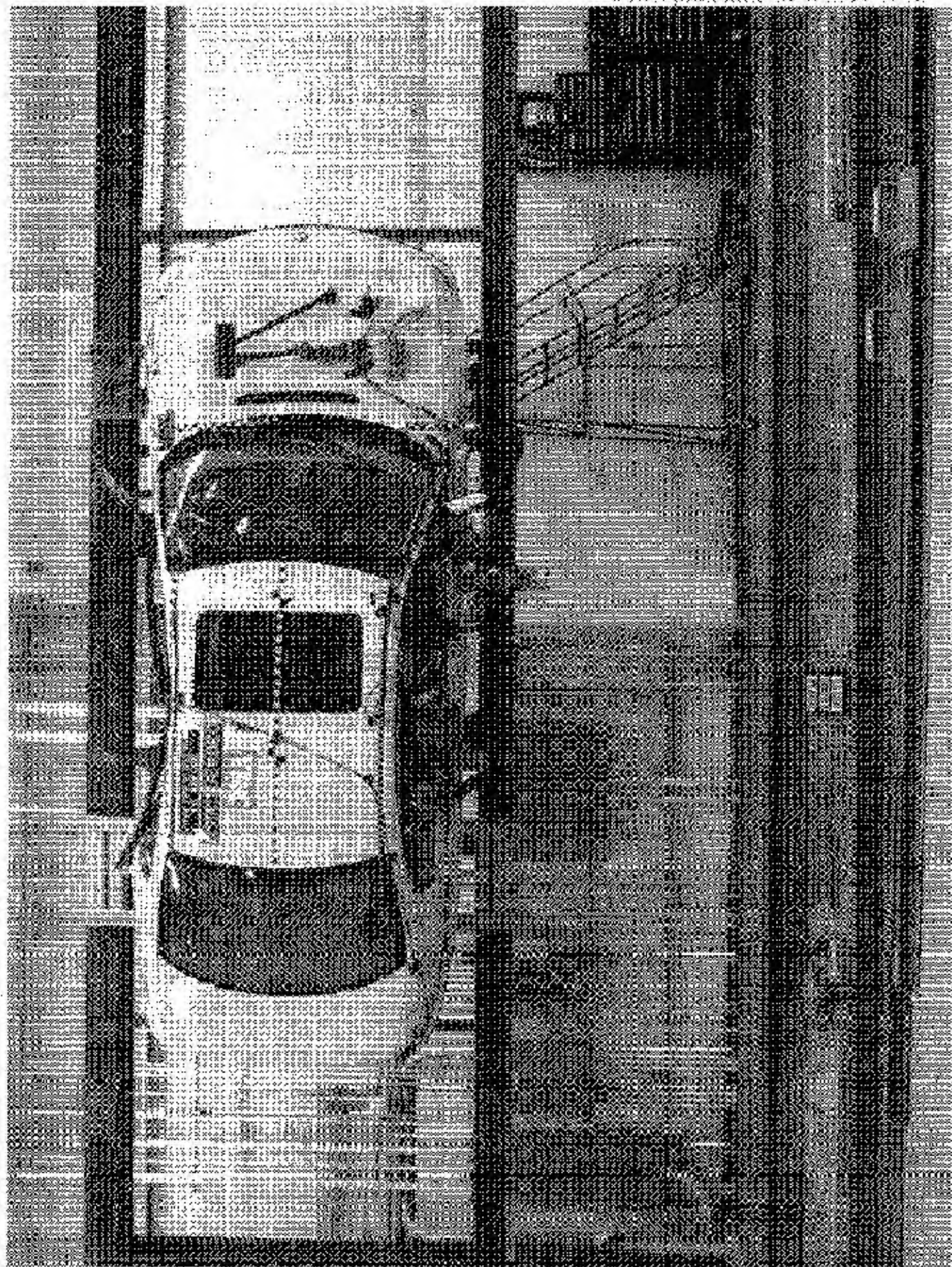


Figure A-54 FMVSS 301 Rollover View at 90°

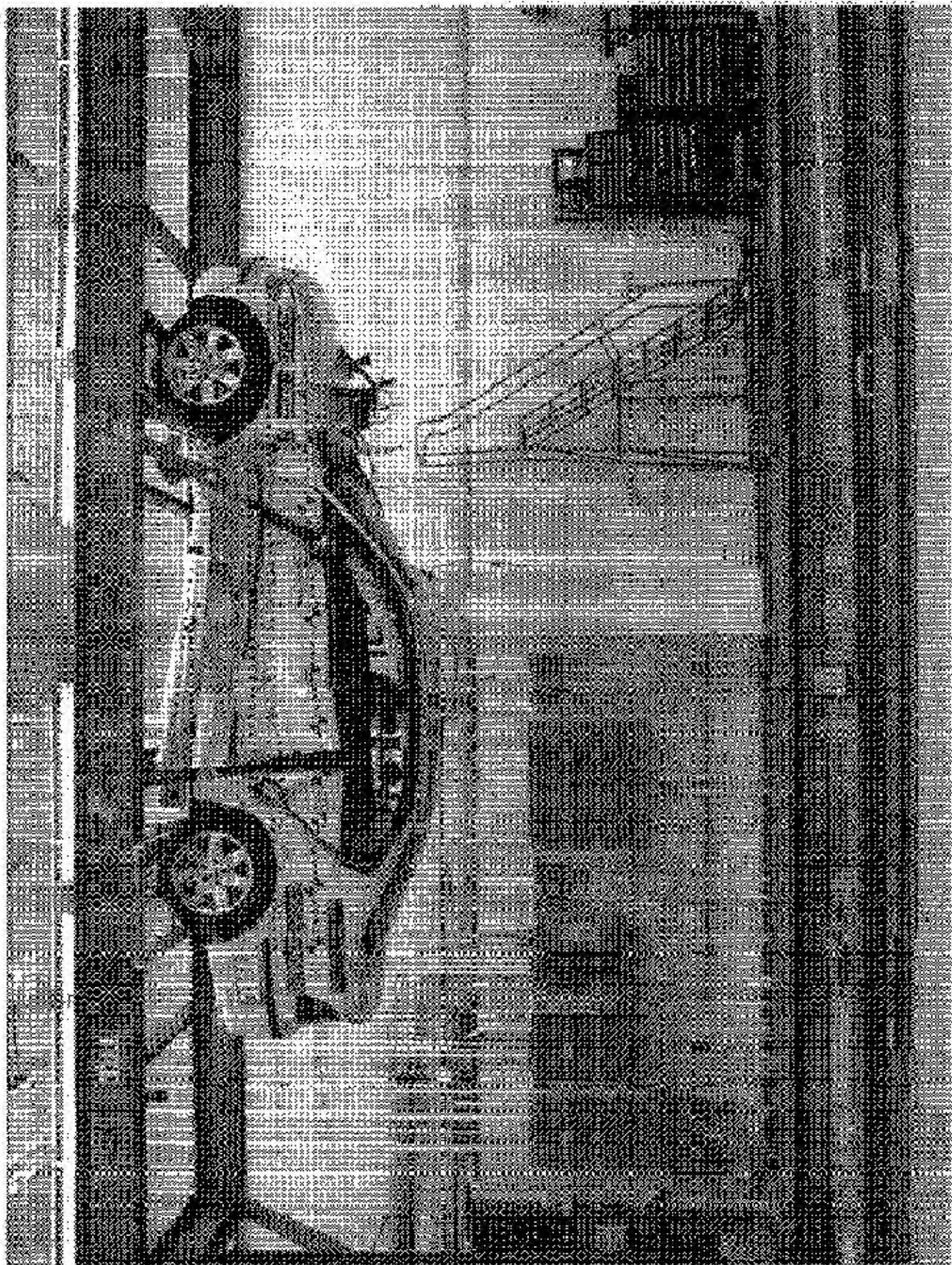


Figure A-55 FMVSS 301 Rollover View at 180°

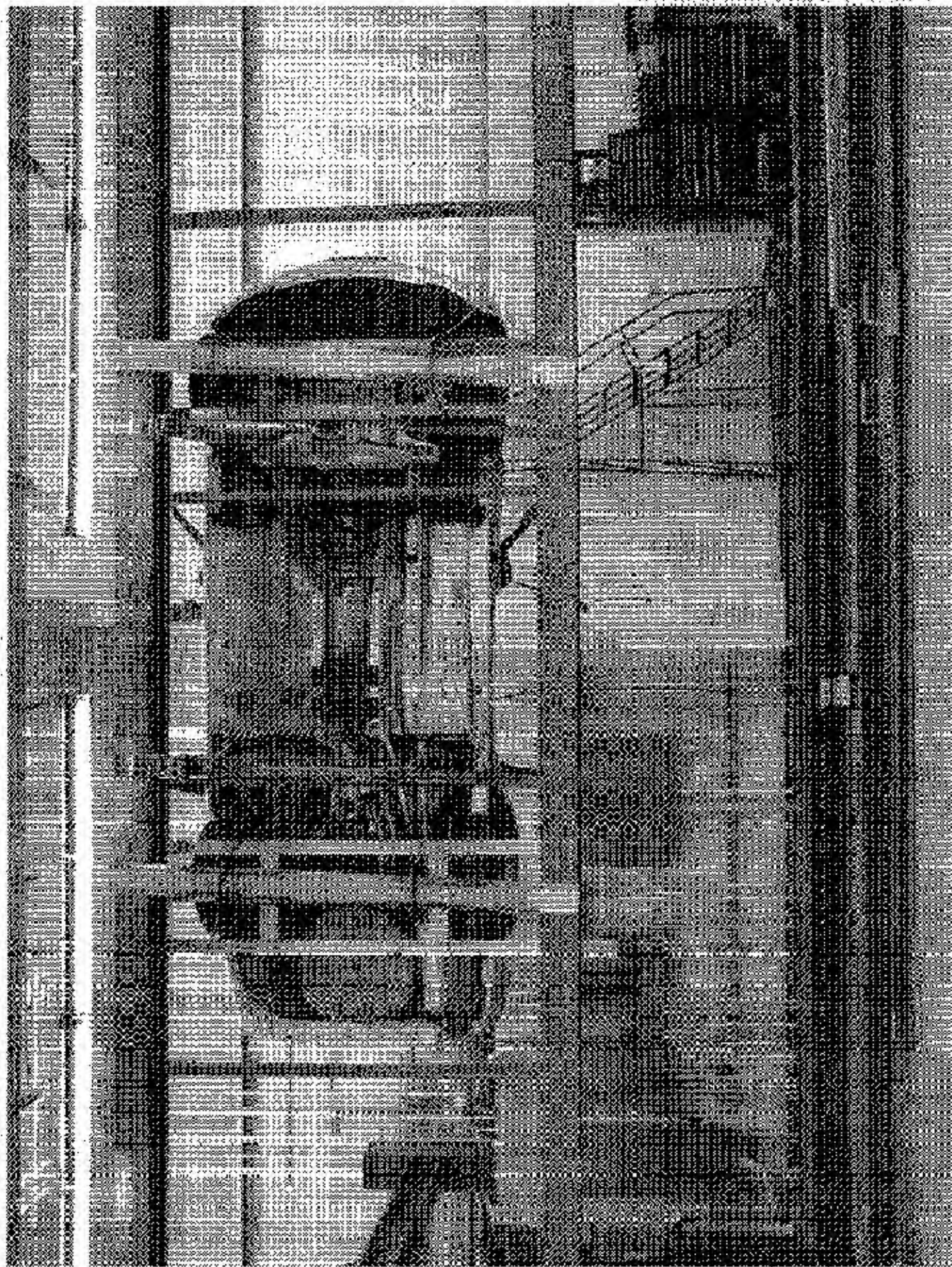


Figure A-56 FMVSS 301 Rollover View at 270°

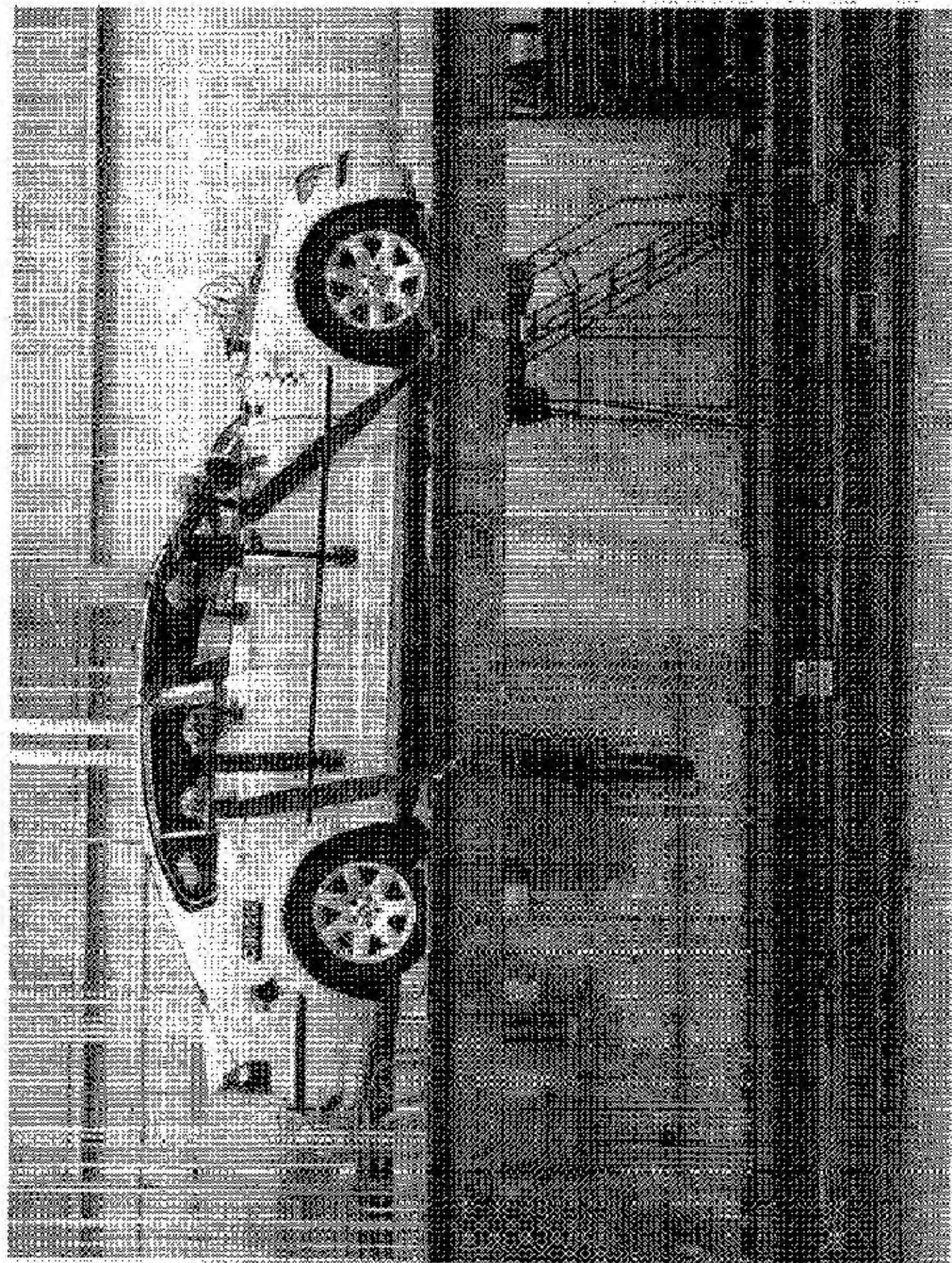


Figure A-57 FMVSS 301 Rollover View at 360°

Appendix B

Data Plots

Table of Data Plots
Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - Filter Class 1000
Integration Data - Filter Class 180
Force Data - Filter Class 1000
Moment Data - Filter Class 600

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	Driver Head X-Axis Acceleration	B-10
2	Driver Head X-Axis Velocity	B-11
3	Driver Head Y-Axis Acceleration	B-12
4	Driver Head Y-Axis Velocity	B-13
5	Driver Head Z-Axis Acceleration	B-14
6	Driver Head Z-Axis Velocity	B-15
7	Driver Head Resultant Acceleration	B-16
8	Driver Neck X-Axis Shear Force	B-17
9	Driver Neck Y-Axis Shear Force	B-18
10	Driver Neck Z-Axis Axial Force	B-19
11	Driver Neck Moment about X Axis	B-20
12	Driver Neck Moment about Y Axis	B-21
13	Driver Neck Moment about Z Axis	B-22
14	Driver Neck Occipital Condyle Moment about X Axis	B-23
15	Driver Upper Rib Y-Axis Acceleration	B-24
16	Driver Upper Rib Y-Axis Velocity	B-25
17	Driver Lower Rib Y-Axis Acceleration	B-26
18	Driver Lower Rib Y-Axis Velocity	B-27
19	Driver Lower Spine Y-Axis Acceleration	B-28
20	Driver Lower Spine Y-Axis Velocity	B-29
21	Driver Pelvis Y-Axis Acceleration	B-30
22	Driver Pelvis Y-Axis Velocity	B-31
23	Left Rear Passenger Head X-Axis Acceleration	B-32
24	Left Rear Passenger Head X-Axis Velocity	B-33
25	Left Rear Passenger Head Y-Axis Acceleration	B-34
26	Left Rear Passenger Head Y-Axis Velocity	B-35
27	Left Rear Passenger Head Z-Axis Acceleration	B-36

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
28	Left Rear Passenger Head Z-Axis Velocity	B-37
29	Left Rear Passenger Head Resultant Acceleration	B-38
30	Left Rear Passenger Neck X-Axis Shear Force	B-39
31	Left Rear Passenger Neck Y-Axis Shear Force	B-40
32	Left Rear Passenger Neck Z-Axis Axial Force	B-41
33	Left Rear Passenger Neck Moment about X Axis	B-42
34	Left Rear Passenger Neck Moment about Y Axis	B-43
35	Left Rear Passenger Neck Moment about Z Axis	B-44
36	Left Rear Passenger Neck Occipital Condyle Moment about X Axis	B-45
37	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-46
38	Left Rear Passenger Upper Rib Y-Axis Velocity	B-47
39	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-48
40	Left Rear Passenger Lower Rib Y-Axis Velocity	B-49
41	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-50
42	Left Rear Passenger Lower Spine Y-Axis Velocity	B-51
43	Left Rear Passenger Pelvis Y-Axis Acceleration	B-52
44	Left Rear Passenger Pelvis Y-Axis Velocity	B-53

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
45	Driver Head X-Axis Redundant Acceleration	B-55
46	Driver Head X-Axis Redundant Velocity	B-56
47	Driver Head Y-Axis Redundant Acceleration	B-57
48	Driver Head Y-Axis Redundant Velocity	B-58

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
49	Driver Head Z-Axis Redundant Acceleration	B-59
50	Driver Head Z-Axis Redundant Velocity	B-60
51	Driver Head Resultant Redundant Acceleration	B-61
52	Driver Upper Rib Y-Axis Redundant Acceleration	B-62
53	Driver Upper Rib Y-Axis Redundant Velocity	B-63
54	Driver Lower Rib Y-Axis Redundant Acceleration	B-64
55	Driver Lower Rib Y-Axis Redundant Velocity	B-65
56	Driver Lower Spine Y-Axis Redundant Acceleration	B-66
57	Driver Lower Spine Y-Axis Redundant Velocity	B-67
58	Driver Pelvis Y-Axis Redundant Acceleration	B-68
59	Driver Pelvis Y-Axis Redundant Velocity	B-69
60	Left Rear Passenger Head X-Axis Redundant Acceleration	B-70
61	Left Rear Passenger Head X-Axis Redundant Velocity	B-71
62	Left Rear Passenger Head Y-Axis Redundant Acceleration	B-72
63	Left Rear Passenger Head Y-Axis Redundant Velocity	B-73
64	Left Rear Passenger Head Z-Axis Redundant Acceleration	B-74
65	Left Rear Passenger Head Z-Axis Redundant Velocity	B-75
66	Left Rear Passenger Head Resultant Redundant Acceleration	B-76
67	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-77
68	Left Rear Passenger Upper Rib Y-Axis Redundant Velocity	B-78
69	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-79
70	Left Rear Passenger Lower Rib Y-Axis Redundant Velocity	B-80
71	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-81
72	Left Rear Passenger Lower Spine Y-Axis Redundant Velocity	B-82
73	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-83
74	Left Rear Passenger Pelvis Y-Axis Redundant Velocity	B-84

Table of Data Plots (Continued)
Test Vehicle Instrumentation Plots
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
75	Right Side Sill at Front Seat X-Axis Acceleration	B-86
76	Right Side Sill at Front Seat X-Axis Velocity	B-87
77	Right Side Sill at Front Seat Y-Axis Acceleration	B-88
78	Right Side Sill at Front Seat Y-Axis Velocity	B-89
79	Right Side Sill at Front Seat Z-Axis Acceleration	B-90
80	Right Side Sill at Front Seat Z-Axis Velocity	B-91
81	Right Side Sill at Front Seat Resultant Acceleration	B-92
82	Right Side Sill at Rear Seat X-Axis Acceleration	B-93
83	Right Side Sill at Rear Seat X-Axis Velocity	B-94
84	Right Side Sill at Rear Seat Y-Axis Acceleration	B-95
85	Right Side Sill at Rear Seat Y-Axis Velocity	B-96
86	Right Side Sill at Rear Seat Z-Axis Acceleration	B-97
87	Right Side Sill at Rear Seat Z-Axis Velocity	B-98
88	Right Side Sill at Rear Seat Resultant Acceleration	B-99
89	Rear Floorpan Above Axle X-Axis Acceleration	B-100
90	Rear Floorpan Above Axle X-Axis Velocity	B-101
91	Rear Floorpan Above Axle Y-Axis Acceleration	B-102
92	Rear Floorpan Above Axle Y-Axis Velocity	B-103
93	Rear Floorpan Above Axle Z-Axis Acceleration	B-104
94	Rear Floorpan Above Axle Z-Axis Velocity	B-105
95	Rear Floorpan Above Axle Resultant Acceleration	B-106
96	Left Side Sill at Front Seat Y-Axis Acceleration	B-107
97	Left Side Sill at Front Seat Y-Axis Velocity	B-108
98	Left Side Sill at Front Seat Y-Axis Displacement	B-109
99	Left Side Sill at Rear Seat Y-Axis Acceleration	B-110
100	Left Side Sill at Rear Seat Y-Axis Velocity	B-111
101	Left Side Sill at Rear Seat Y-Axis Displacement	B-112
102	Right Rear Occupant Compartment Y-Axis Acceleration	B-113
103	Right Rear Occupant Compartment Y-Axis Velocity	B-114

Table of Data Plots (Continued)
Test Vehicle Instrumentation Plots (Continued)
 Acceleration Data - Filter Class 60
 Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
104	Right Rear Occupant Compartment Y-Axis Displacement	B-115
105	Left Lower A-Post Y-Axis Acceleration	B-116
106	Left Lower A-Post Y-Axis Velocity	B-117
107	Left Middle A-Post Y-Axis Acceleration	B-118
108	Left Middle A-Post Y-Axis Velocity	B-119
109	Left Lower B-Post Y-Axis Acceleration	B-120
110	Left Lower B-Post Y-Axis Velocity	B-121
111	Left Middle B-Post Y-Axis Acceleration	B-122
112	Left Middle B-Post Y-Axis Velocity	B-123
113	Left Front Seat Track Y-Axis Acceleration	B-124
114	Left Front Seat Track Y-Axis Velocity	B-125
115	Left Rear Seat Track Y-Axis Acceleration	B-126
116	Left Rear Seat Track Y-Axis Velocity	B-127
117	Vehicle Center of Gravity X-Axis Acceleration	B-128
118	Vehicle Center of Gravity X-Axis Velocity	B-129
119	Vehicle Center of Gravity Y-Axis Acceleration	B-130
120	Vehicle Center of Gravity Y-Axis Velocity	B-131
121	Vehicle Center of Gravity Z-Axis Acceleration	B-132
122	Vehicle Center of Gravity Z-Axis Velocity	B-133
123	Vehicle Center of Gravity Resultant Acceleration	B-134

MDB Instrumentation Plots
 Acceleration Data - Filter Class 60
 Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
124	MDB Center of Gravity X-Axis Acceleration	B-136
125	MDB Center of Gravity X-Axis Velocity	B-137
126	MDB Center of Gravity Y-Axis Acceleration	B-138

Table of Data Plots (Continued)

MDB Instrumentation Plots (Continued)

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

Contact Data - Filter Class 1000

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
127	MDB Center of Gravity Y-Axis Velocity	B-139
128	MDB Center of Gravity Z-Axis Acceleration	B-140
129	MDB Center of Gravity Z-Axis Velocity	B-141
130	MDB Center of Gravity Resultant Acceleration	B-142
131	MDB Left Rear X-Axis Acceleration	B-143
132	MDB Left Rear X-Axis Velocity	B-144
133	MDB Left Rear Y-Axis Acceleration	B-145
134	MDB Left Rear Y-Axis Velocity	B-146
135	MDB Right Side Contact Switch	B-147
136	MDB Left Side Contact Switch	B-148

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - FIR Filtered

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
137	Driver Upper Rib Y-Axis Acceleration	B-150
138	Driver Lower Rib Y-Axis Acceleration	B-151
139	Driver Lower Spine Y-Axis Acceleration	B-152
140	Driver Pelvis Y-Axis Acceleration	B-153
141	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-154
142	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-155
143	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-156
144	Left Rear Passenger Pelvis Y-Axis Acceleration	B-157

Table of Data Plots (Continued)
 Driver and Passenger Dummy Instrumentation Plots
 Acceleration Data - FIR Filtered - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
145	Driver Upper Rib Y-Axis Redundant Acceleration	B-159
146	Driver Lower Rib Y-Axis Redundant Acceleration	B-160
147	Driver Lower Spine Y-Axis Redundant Acceleration	B-161
148	Driver Pelvis Y-Axis Redundant Acceleration	B-162
149	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-163
150	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-164
151	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-165
152	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-166

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

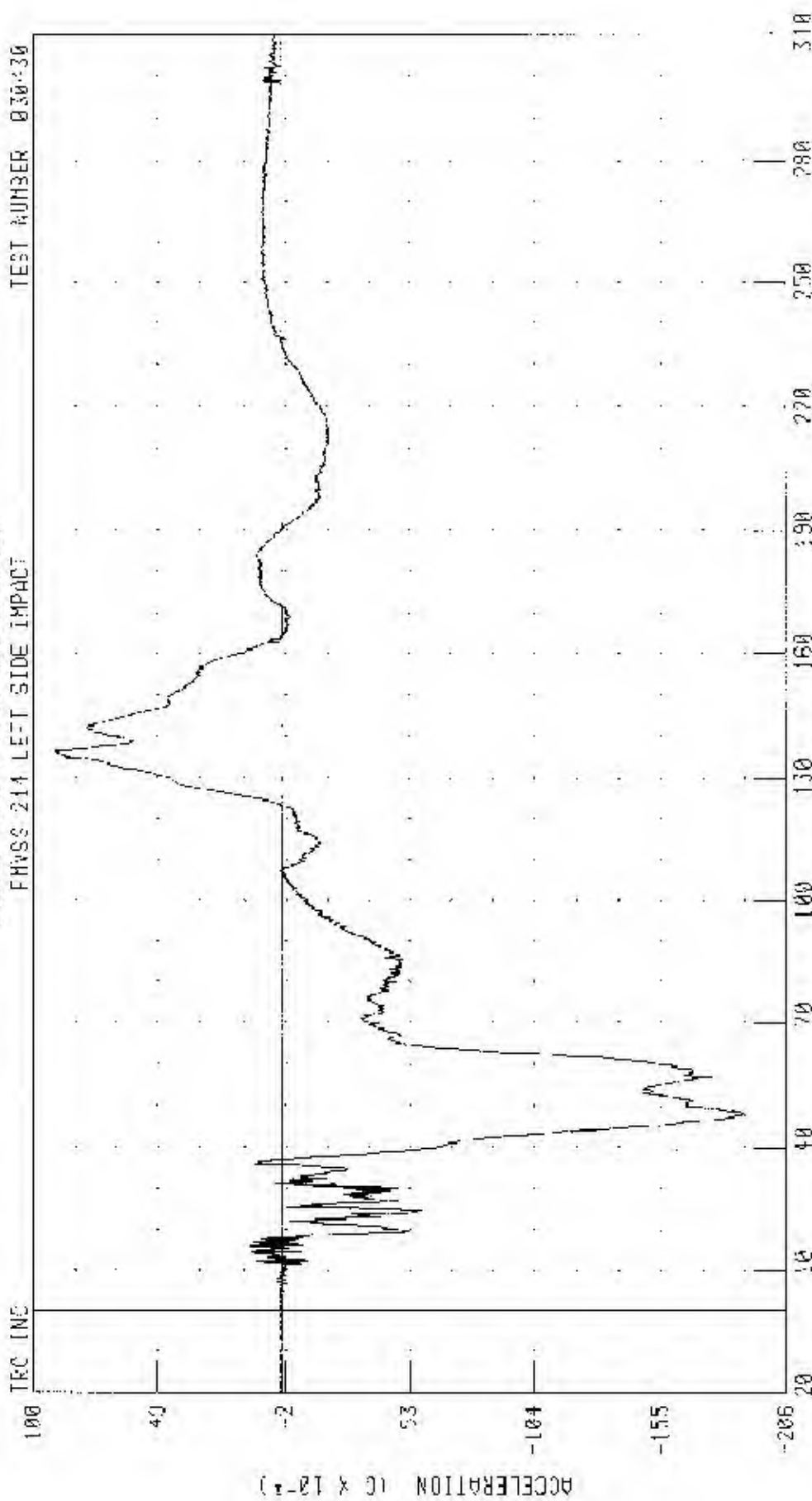
Moment Data - Filter Class 600

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD X-AXIS ACCELERATION

FHVS-214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (ms)

CHANNEL: HEDXG1 FILTER: CII CLASS 1000

PEAK DATA: 315 G @ 136.62 ms, 10.32 G @ 48.16 ms

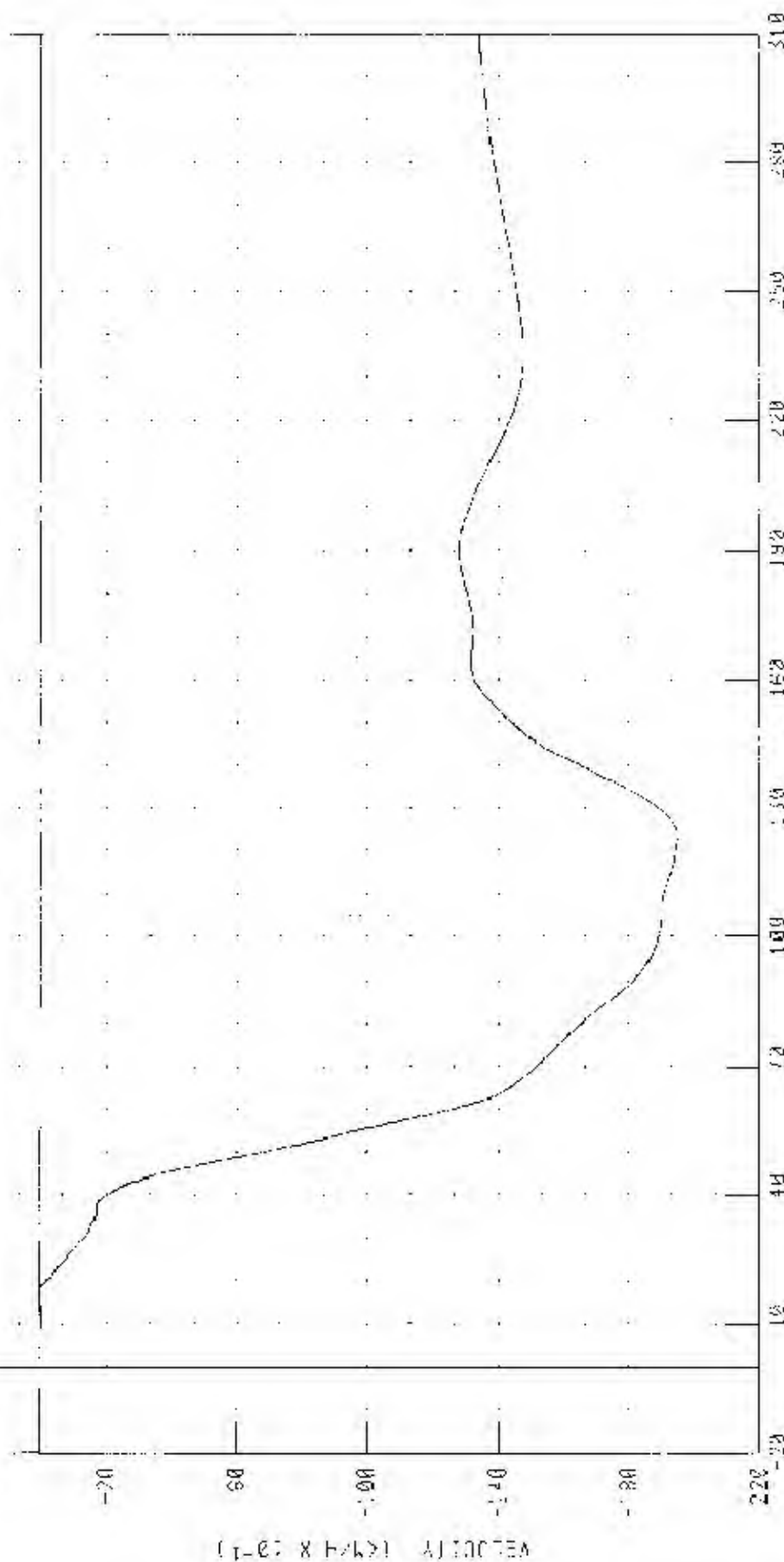
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARREL) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD X-AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430

20 100 INC.



TIME (MS)

CHANNEL FE00XV1 FILTER OF CLOSURE

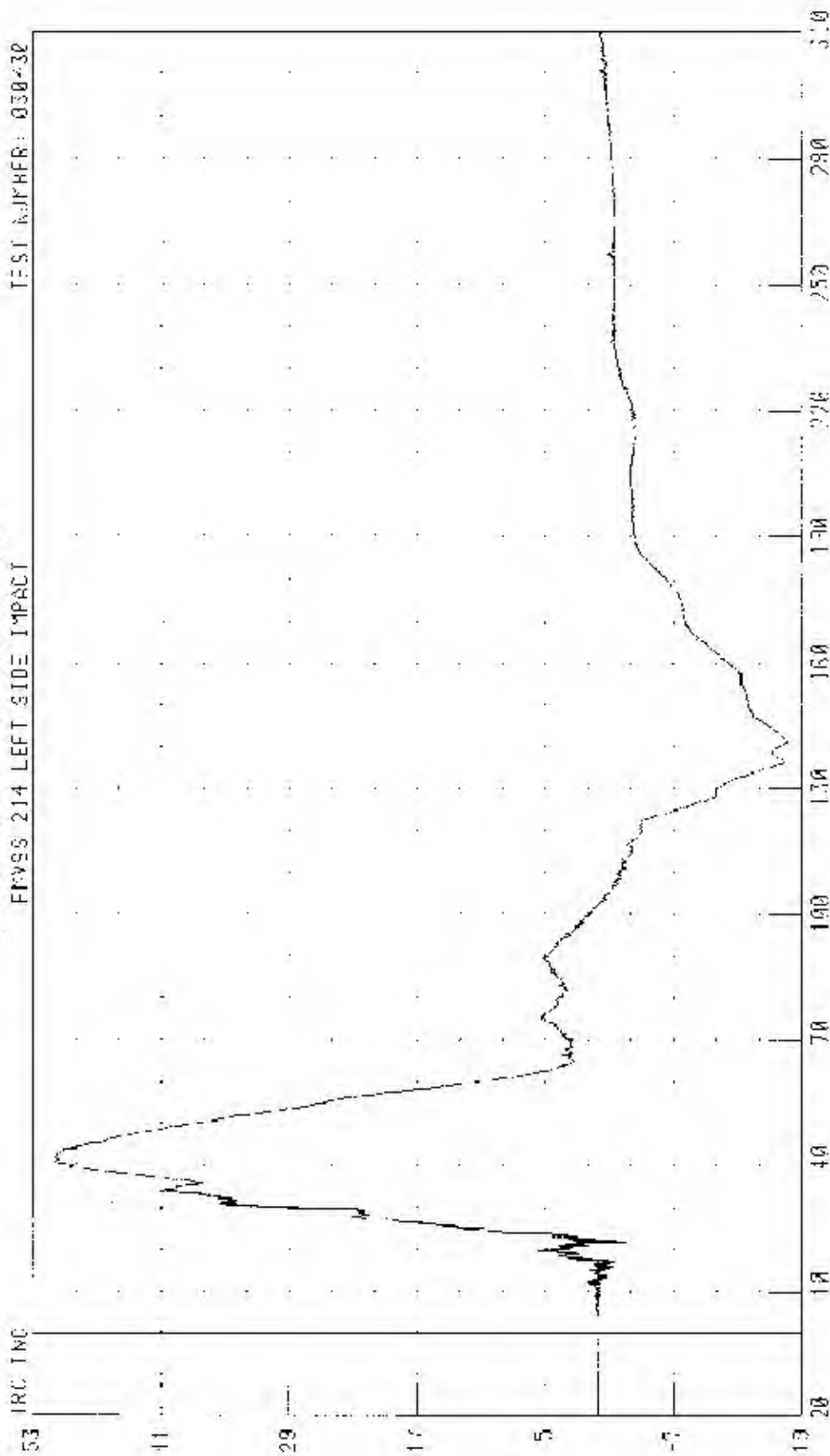
PHAS DATA 0.02 ENH 0 17.84 MS, -19.51 MS, 123.92 MS

53/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD Y AXIS ACCELERATION

FRVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430



(C) NOT TO BE REPRODUCED

TIME (MS)

CHANNEL HEAD Y CH CLASH 1000

PEAK DATA: 50.47 30.42 80 MS; -17.82 111.23 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INIT LEFT SIDE OF 200S RWY 05/28

DRIVER HAJ 7-AXIS VEHICLE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430

TRC INC

340

450

350

250

150

50

0

-20

10

40

70

100

130

160

190

220

250

280

310

340

370

400

430

460

490

520

550

580

610

640

670

700

730

760

790

820

850

880

910

940

970

1000

1030

1060

1090

1120

1150

1180

1210

1240

1270

1300

1330

1360

1390

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1450

1480

1510

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1570

1600

1630

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1720

1750

1780

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1870

1900

1930

1960

1990

2020

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2110

2140

2170

2200

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2320

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2500

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3220

3250

3280

3310

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3370

3400

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3700

3730

3760

3790

3820

3850

3880

3910

3940

3970

4000

4030

4060

4090

4120

4150

4180

4210

4240

4270

4300

4330

4360

4390

4420

4450

4480

4510

4540

4570

4600

4630

4660

4690

4720

4750

4780

4810

4840

4870

4900

4930

4960

4990

5020

5050

5080

5110

5140

5170

5200

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7000

7030

7060

7090

7120

7150

7180

7210

7240

7270

7300

7330

7360

7390

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8110

8140

8170

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8470

8500

8530

8560

8590

8620

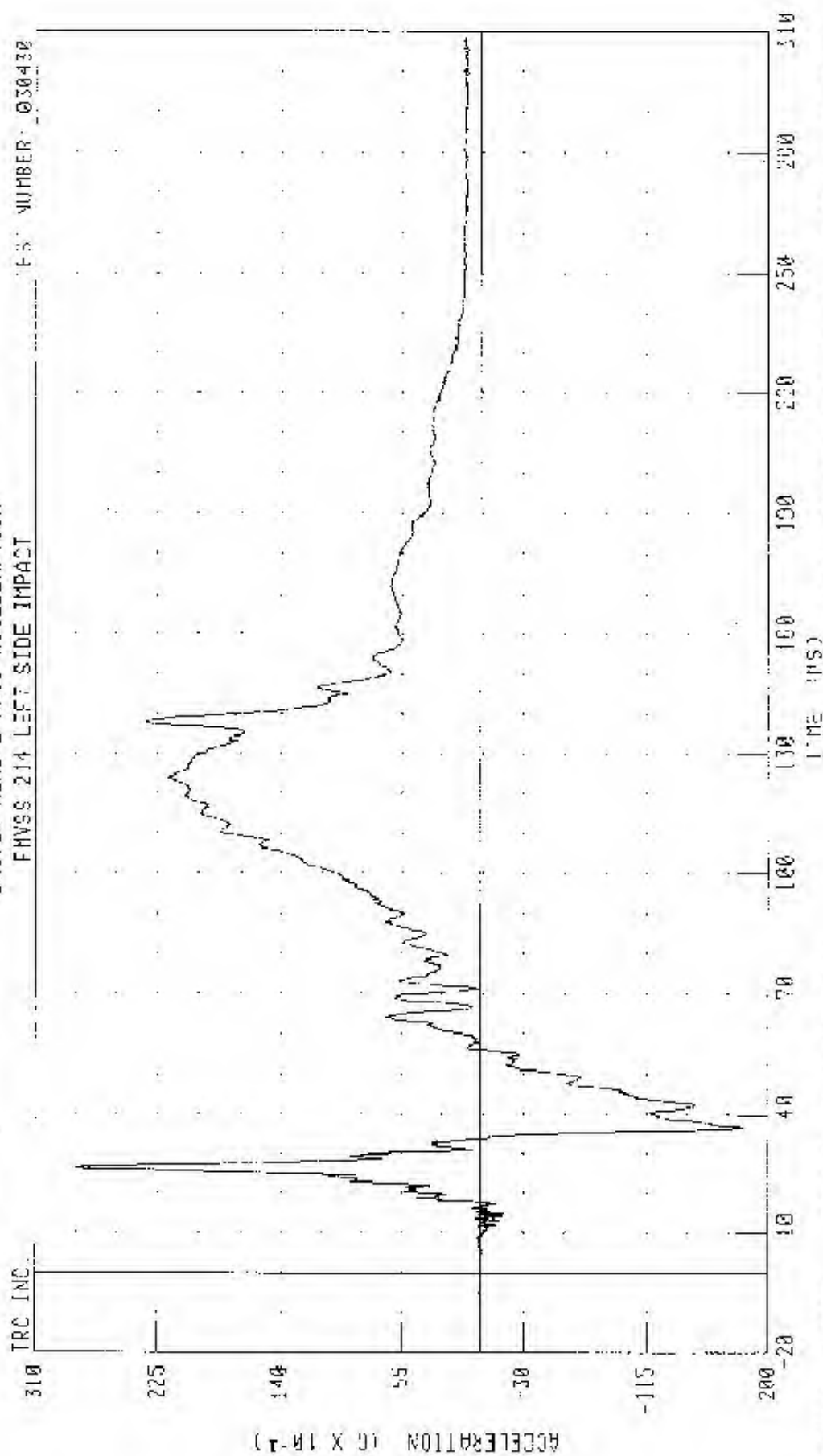
8650

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD Z-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL HEAD01 FILTER 300 CLASS 1000

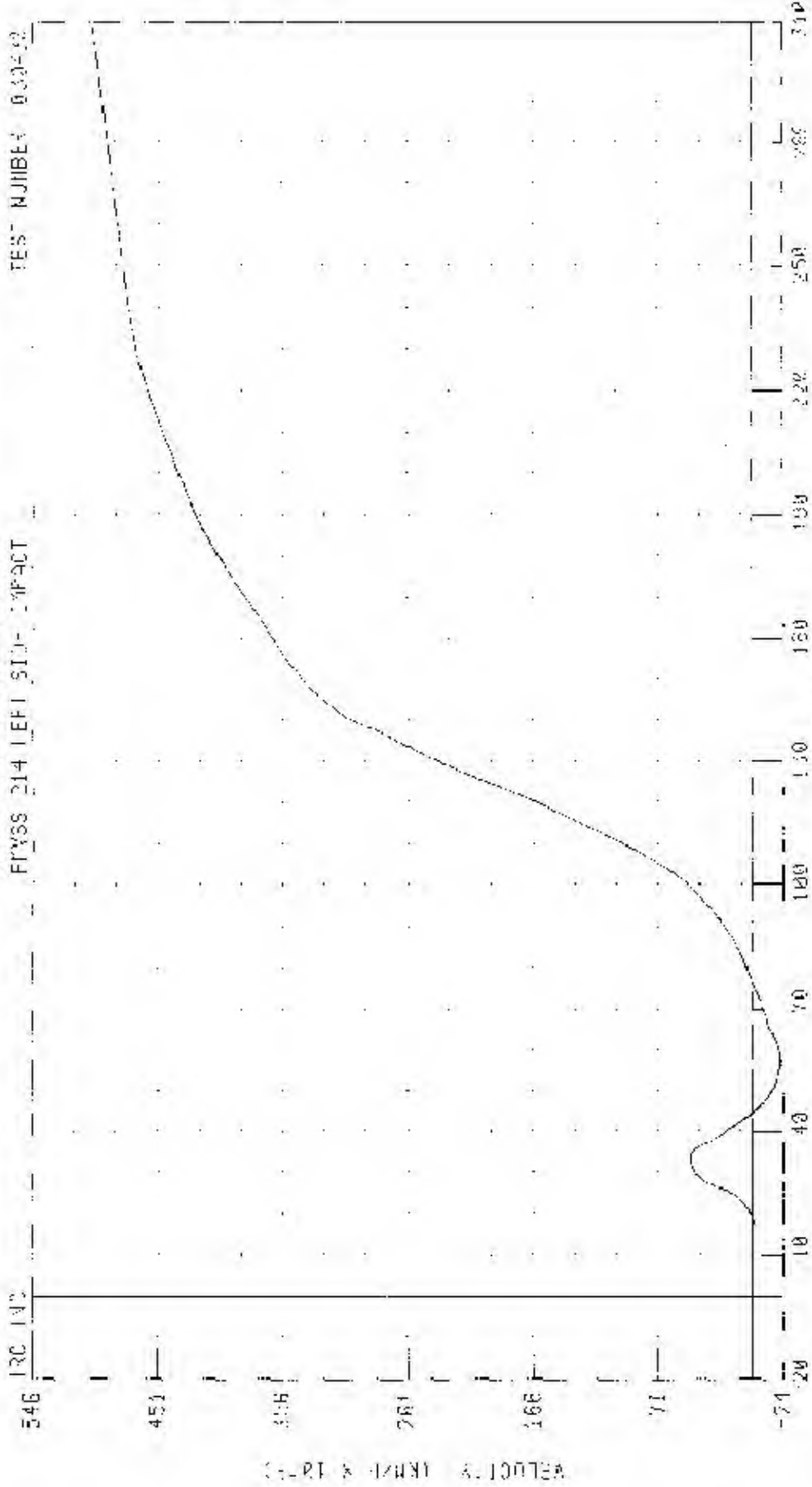
PEAK DATA 28.13 G @ 28.21 MS, -18.53 G @ 35.32 MS

55228 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER SEAT 2 AXIS VELOCITY

FLYSS 214 LEFT SIDE IMPACT

TEST NUMBER 000-02



VELOCITY (KPH) (X100)

TIME (MS)

PEAK 1110 500 KPH 90 DEGREE SIDE IMPACT 000-02

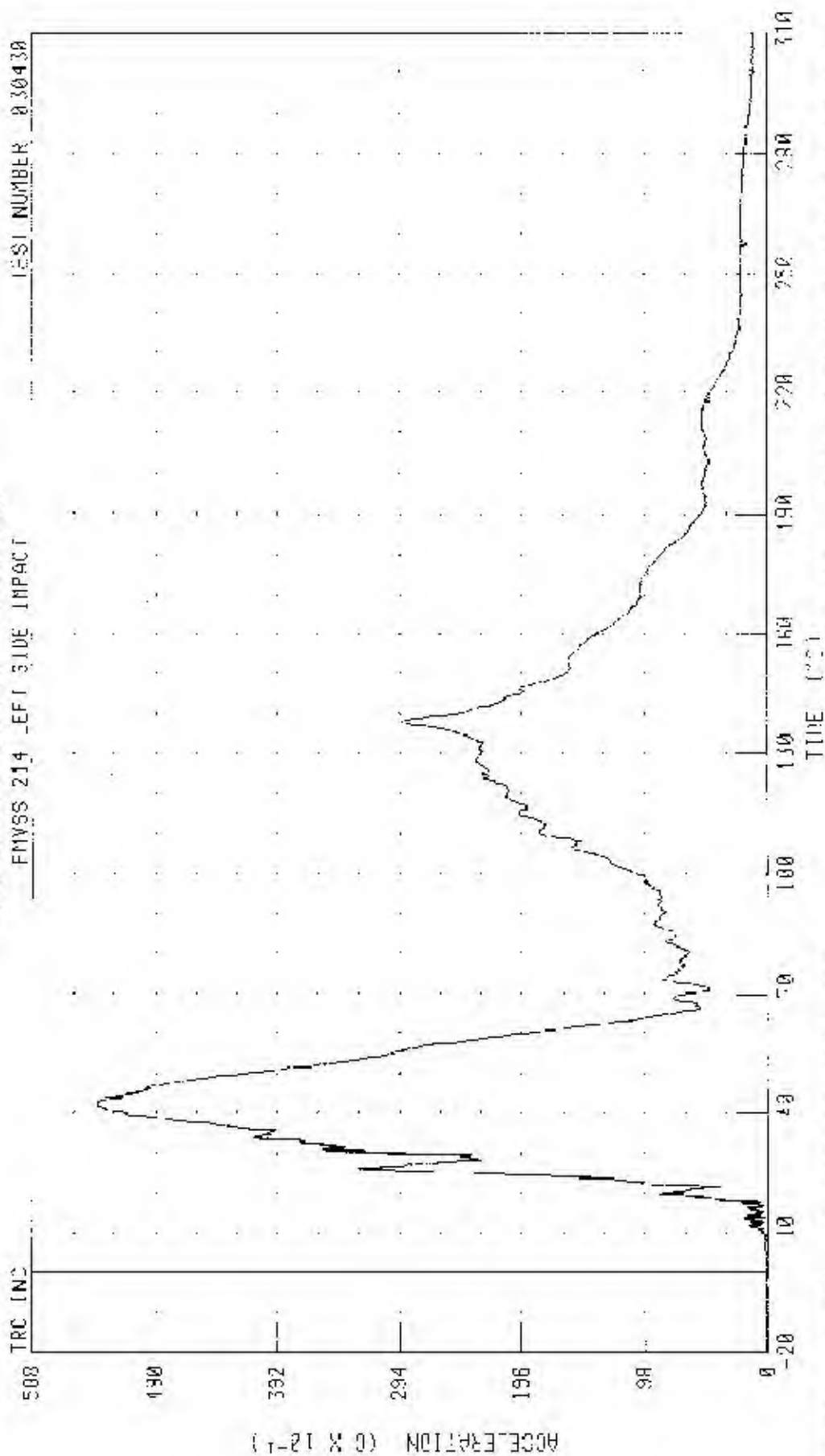
CANAL 1 HCH2V1 FILTER 2H 0158182

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL 1 - EDR01 L - 11TH CH CLASS 10300

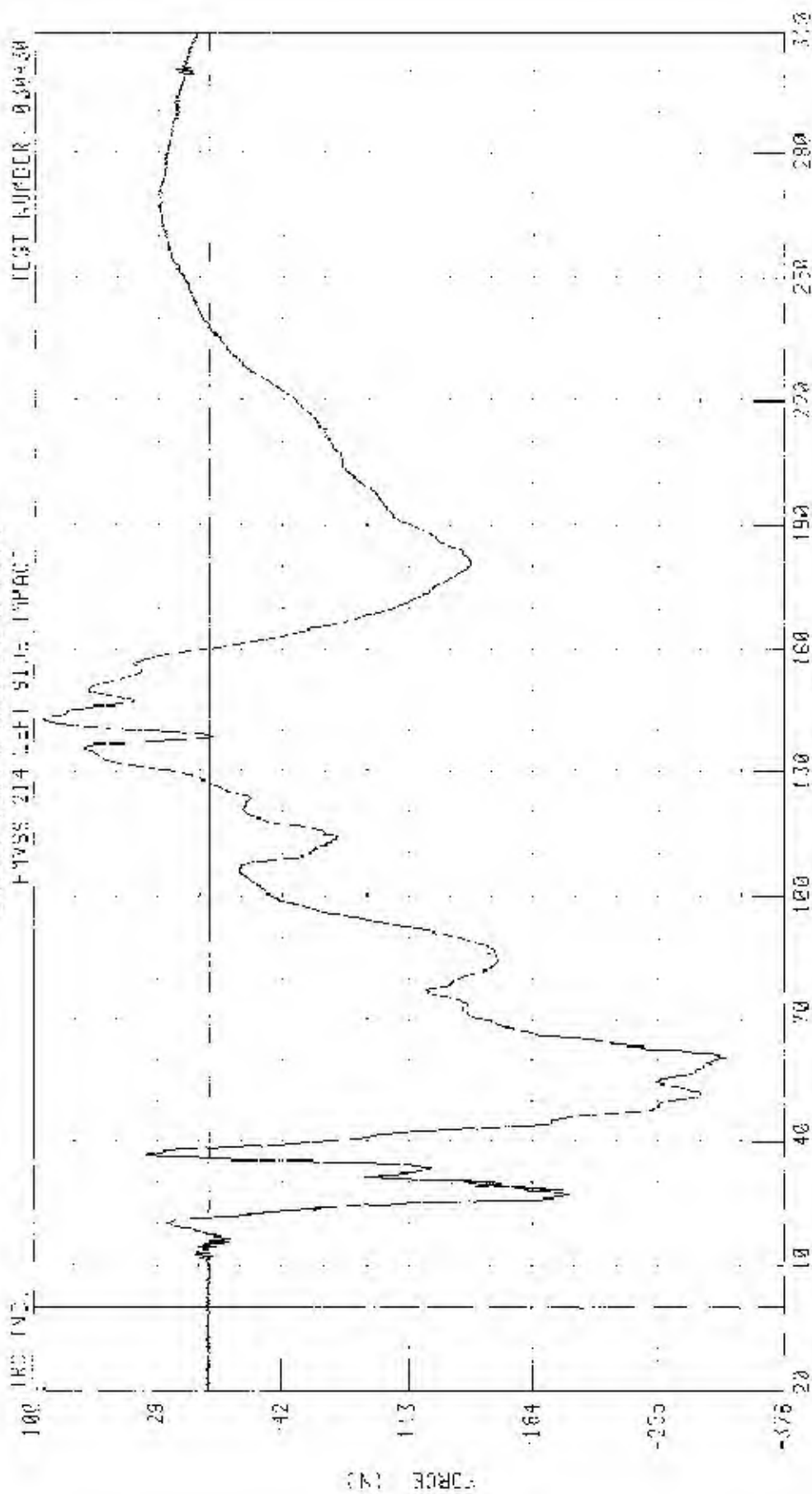
PEAK DATA 53.71 0 0 42.32 MS, 0.01 0 0 -20 00 14

55/28 2PH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER IN 0 LEFT SIDE OF CARO RHW 5251

DRIVER NECK X-AXIS SHEAR FORCE

FMSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430



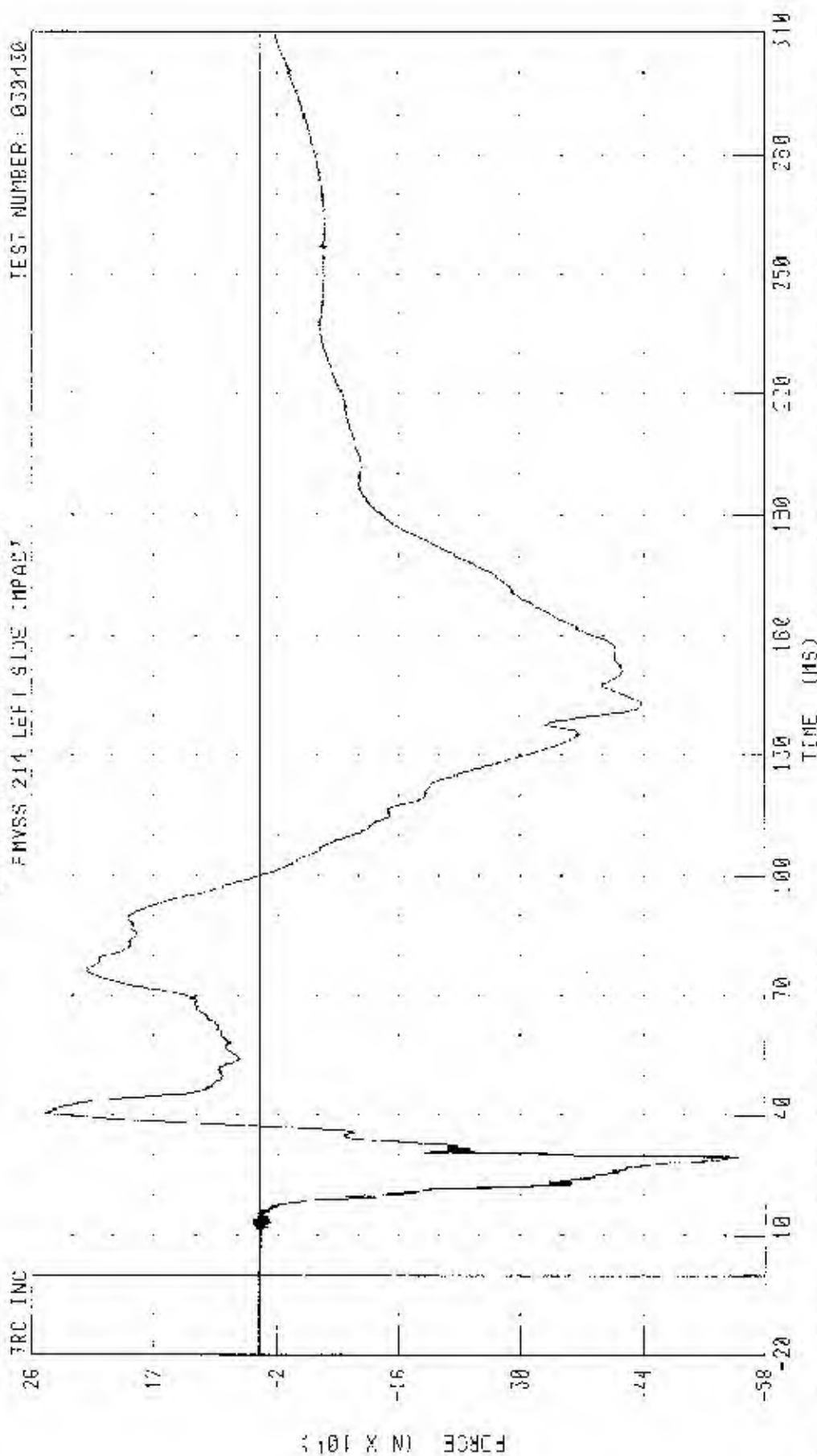
CHANNEL: NEXUS1 FILTER: CH CLASS: 1000 TIME (MS): 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 310

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORABLE BARR. RT. END LEFT SIDE OF 2003 BMW 525i)

DRIVER NECK Y-AXIS SHEAR FORCE

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 032430



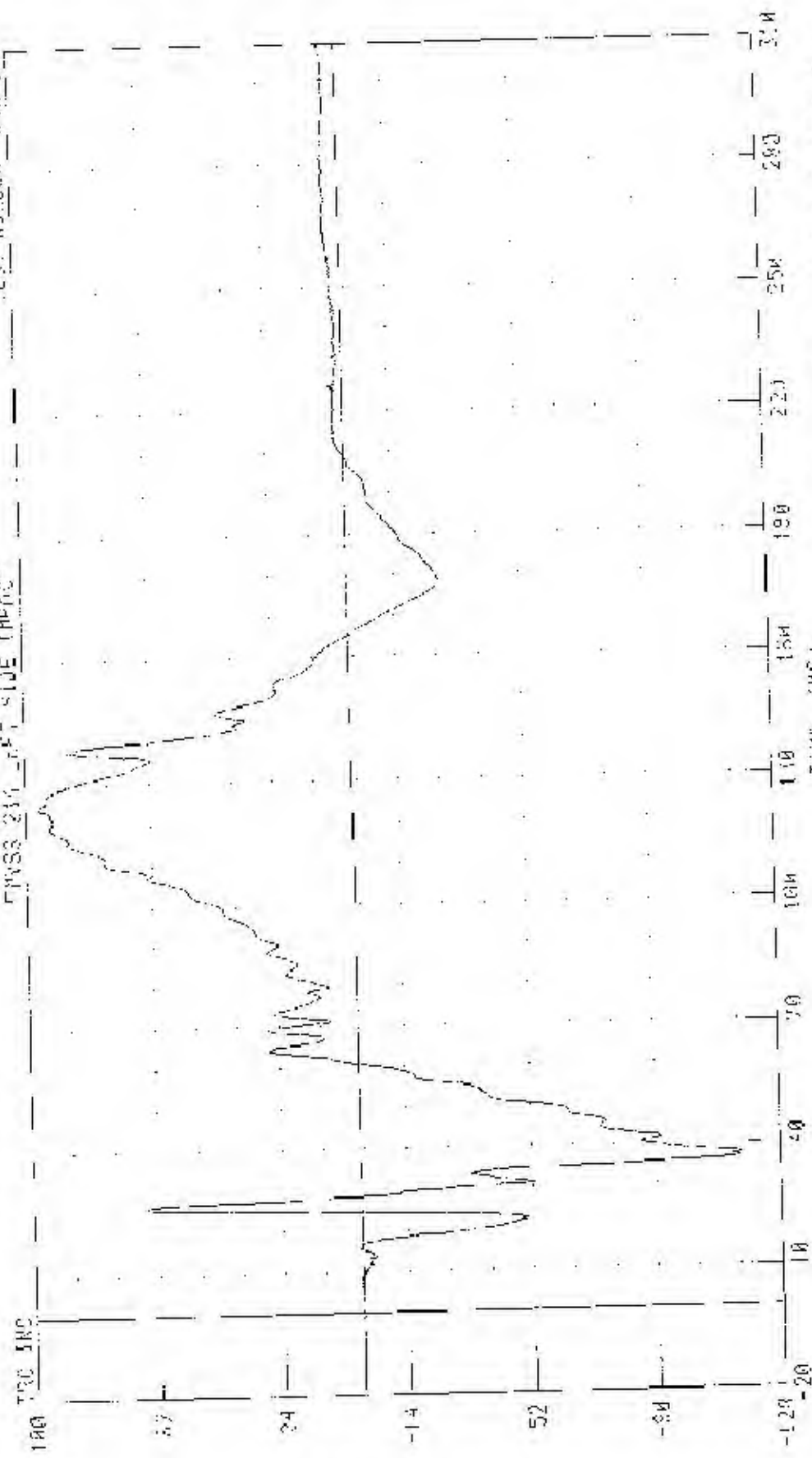
CHANNEL: N=V21 FILTER: CH CLASS: 1000

PEAK DATA: 245.24 N @ 130.38 MS; -349.60 N @ 230.12 MS

55278 KFH 30 DEGREE SIDE IMPACT COLLISION REFLECTOR + BARRIER INTO LEFT SIDE OF 2003 BMW 320i

DRIVER SEAT 7 DAYS AXIAL FORCE
FWSS 214 LEFT SIDE IMPACT

TEST NUMBER 00430



TIME (MS) 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

CHANNEL 1: KHZF1 FILTER: CH 0 USE 100K

FORCE (N X 10^3)

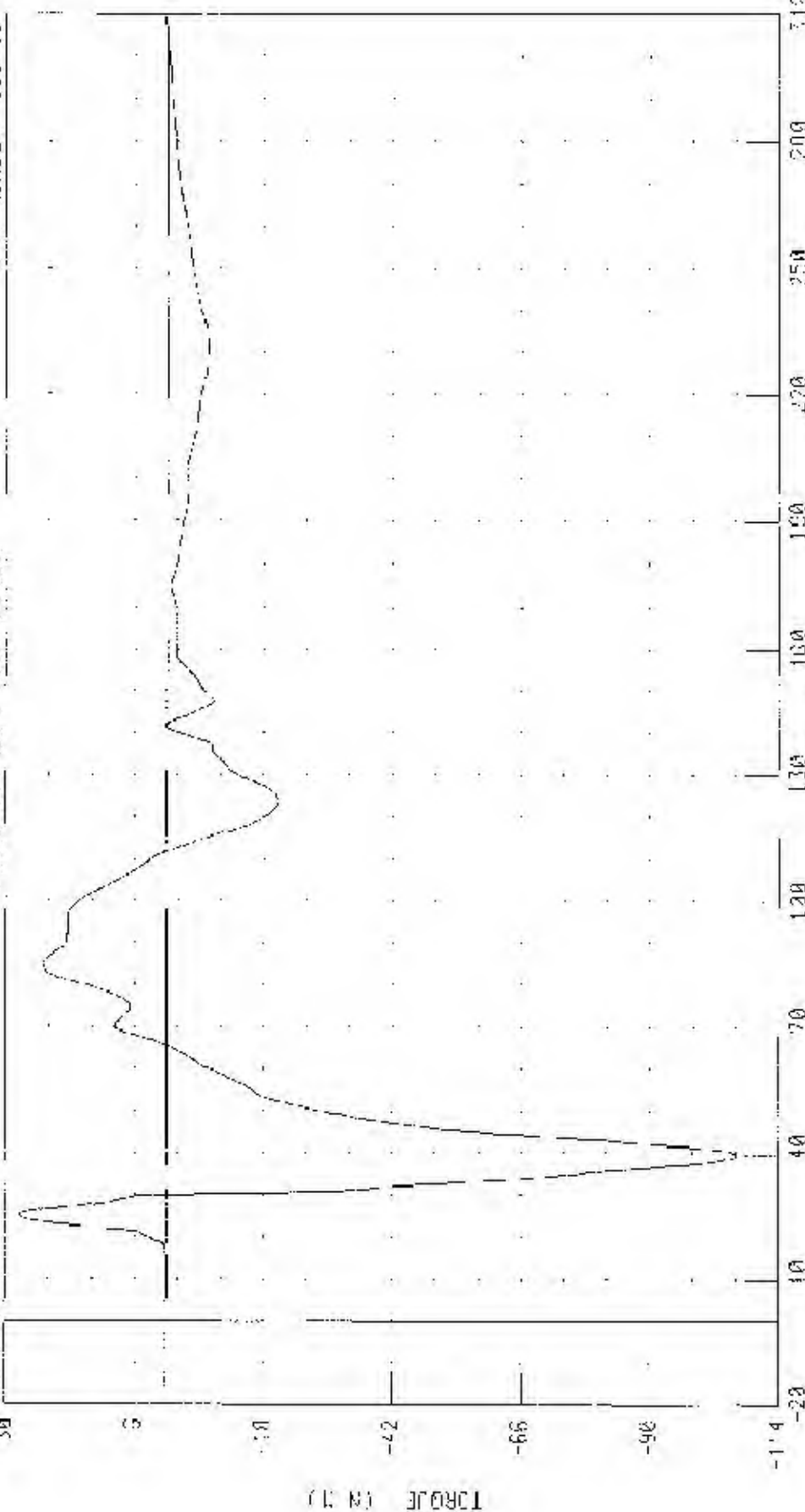
55/23 KFH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BORDER) IN 0 LEFT SIDE OF 2003 EHV 3251

DRIVER NECK MOMENT ABOUT X AXIS

IRCL INC

FIG NUMBER 030-30

FMVSS 214 LEFT SIDE IMPACT



TIME (MS)

CITATION: NECKM1 FILTER CH CLASS 000

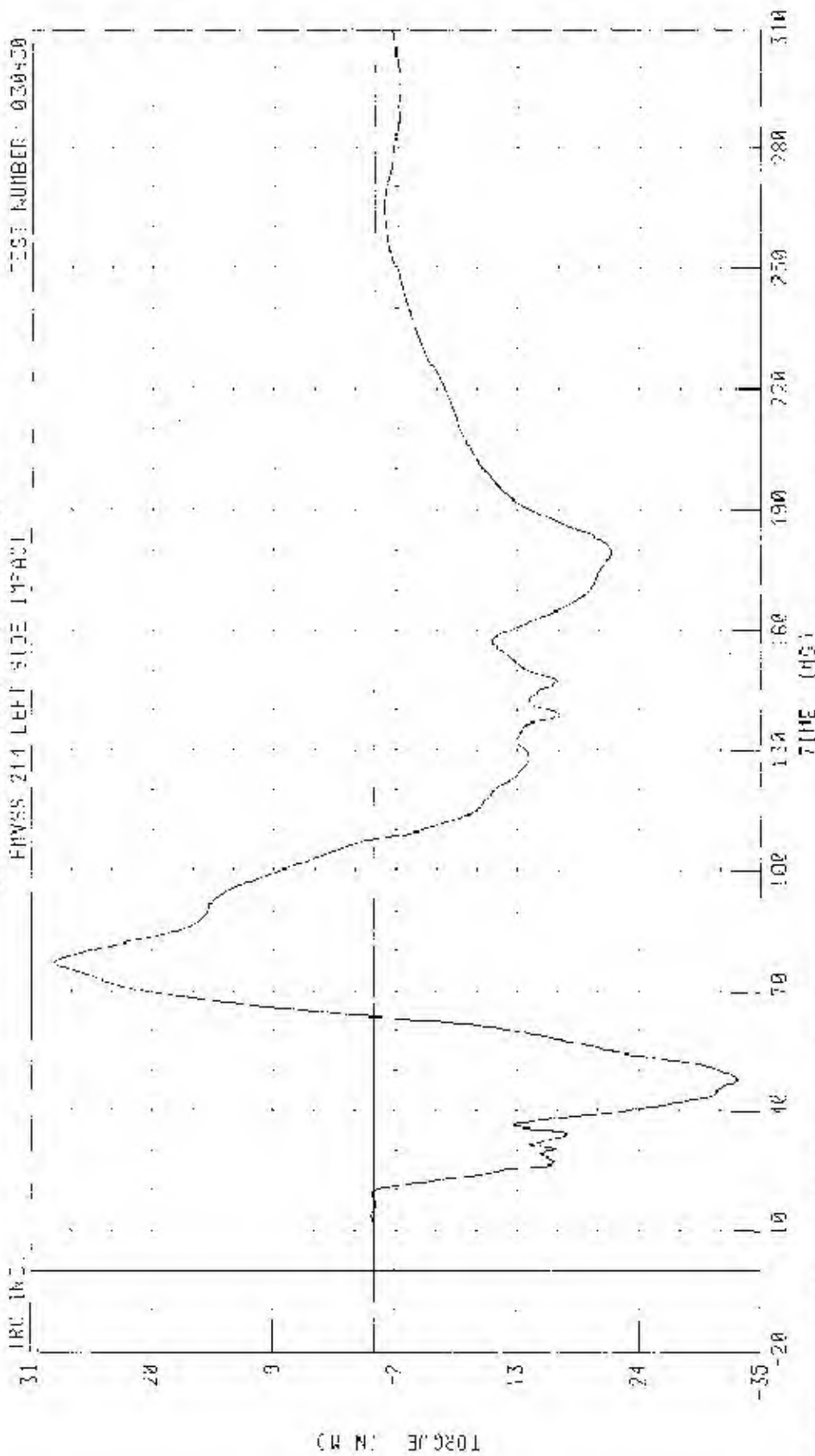
FILE: DATA 27 07 N F 0 25 36 75, -106 25 N D 0 39 44 13

55/20 MPH 92 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2403 RVM 3251

DRIVER NECK HEIGHT ABOUT Y-AXIS

HYDRA 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

CHANNEL VERINT FILTER CH CROSS FOR

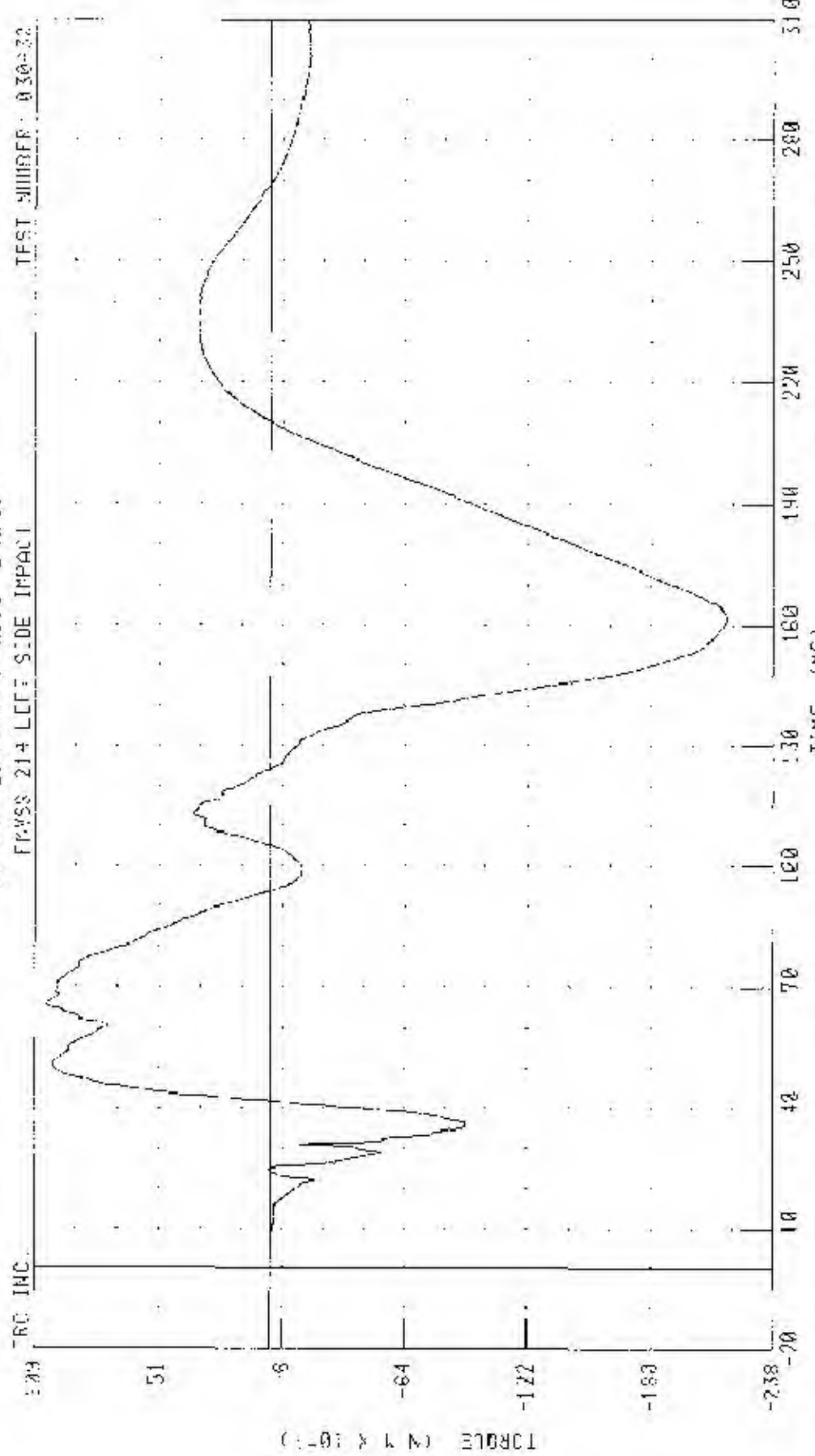
PEAK DATA 20 02 N M W 77 24 MS, -32 04 N M W 47 01 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARrier) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 030-32

FRYSS 214 LEFT SIDE IMPACT



PEAK DATA: 10 51 N H 0 65.76 MS; -21 59 N 1 0 101.70 MS

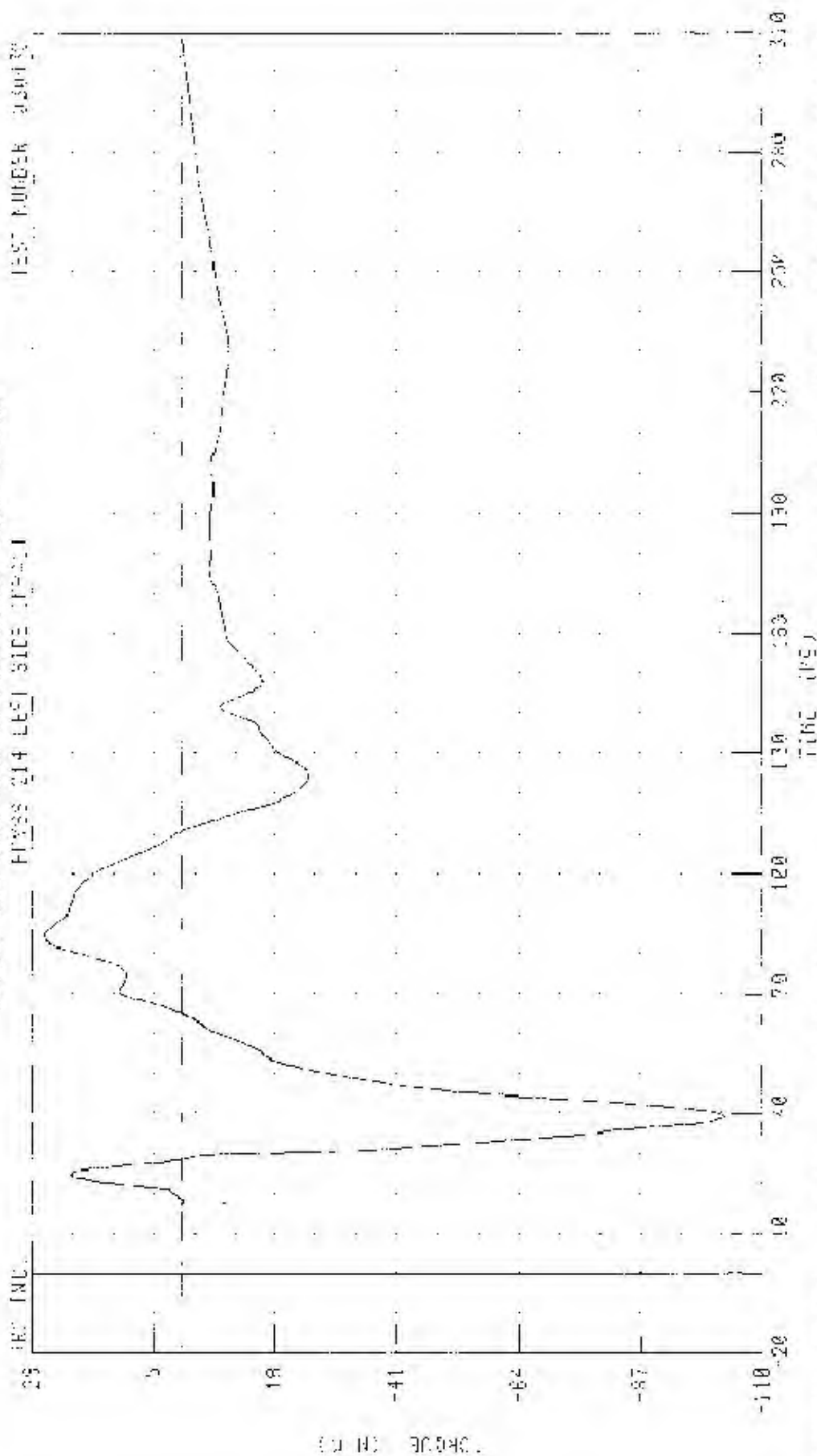
CHANNEL: NECKZM1 FILTER: C-CLASS: 200

55.73 KPH 300 DRIVE SHAFT INPUT POWER, INCREASE REPORTED 15-1-13 14 06 2023 BY W. J. J.

DRIVE SHAFT OCCUPANT COMFORT ABOUT X AXIS

FLYING 214 LEFT SIDE 17-1-13

TEST NUMBER 030430



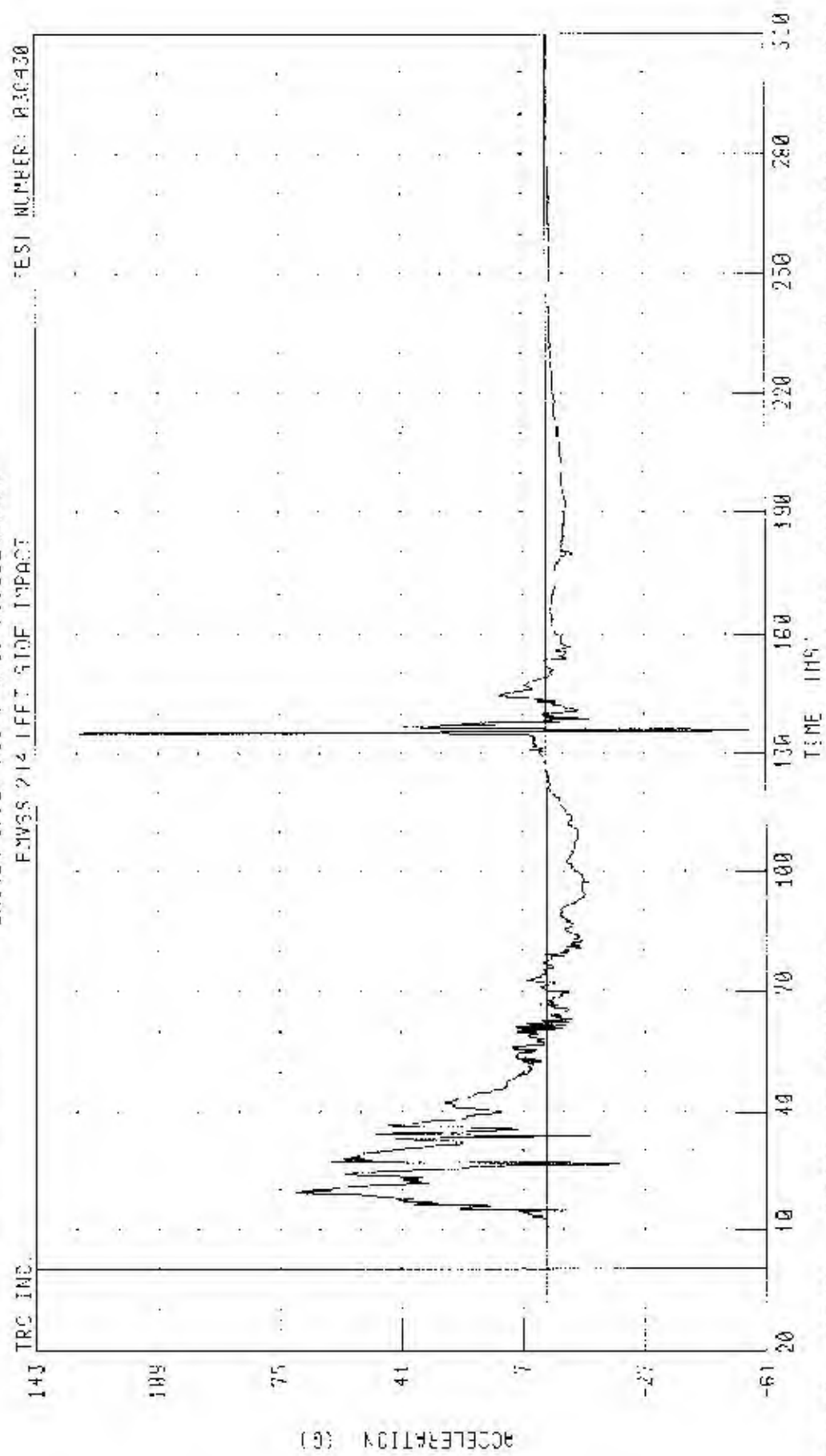
CHANNEL 1000000 FILTER 20 HZ BAND 500

PEAK 1000000 20 HZ BAND 500 100 20 HZ BAND 500

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 HWY 3251

DRIVER UPPER R13 Y-AXIS ACCELERATION

FWSS 214 LEFT SIDE IMPACT TEST NUMBER: R10430



TIME (MS)

CHANNEL LUR1G1 FILTER: GP CLASS 1000

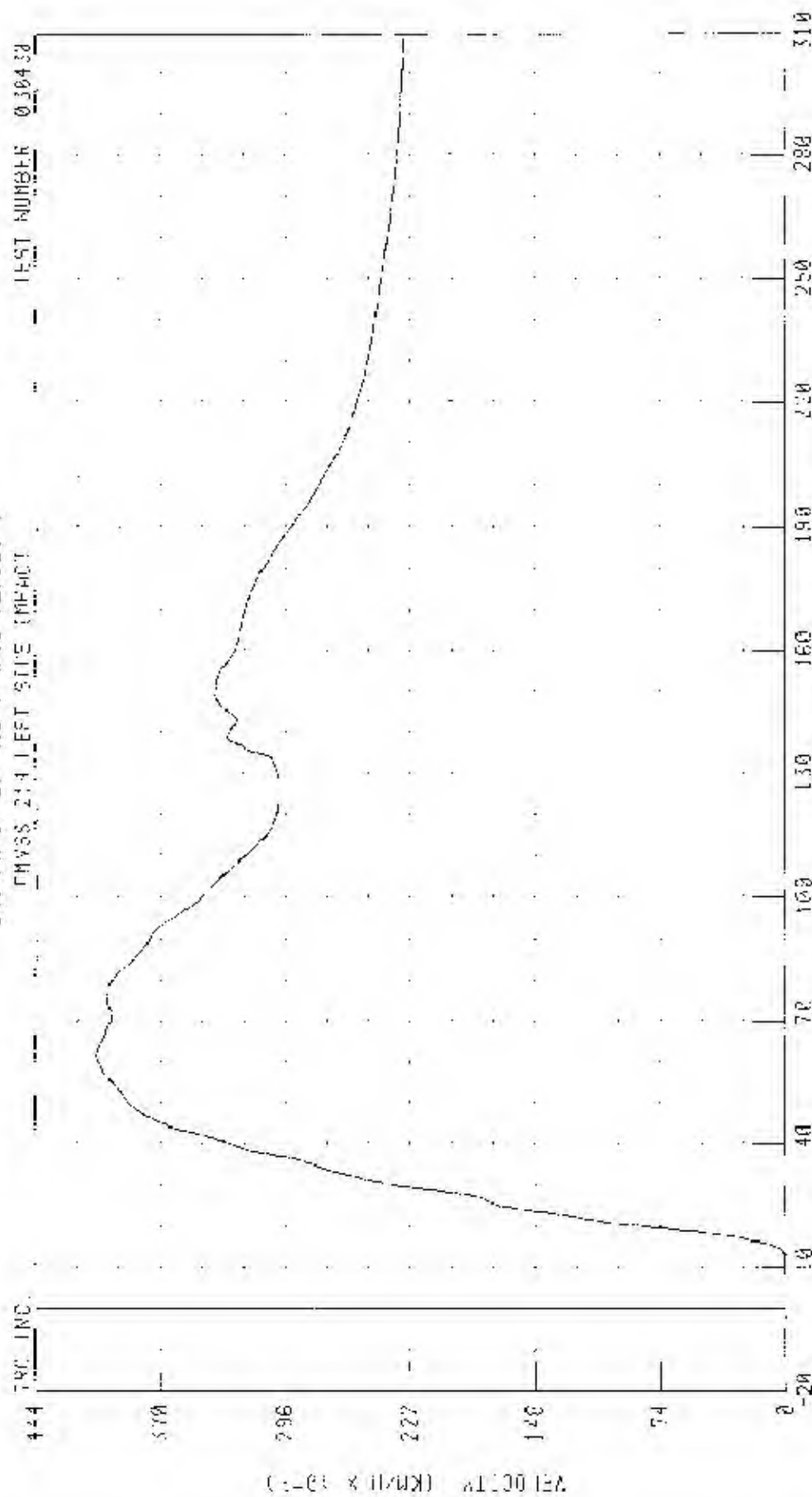
PEAK DATA 130.06 0 135.78 MS, -55.07 G @ 135.92 MS

51428 XPL 90 THREE SIDE IMPACT (MOVING DEFLECTOR BARRIER) INTO LEFT SIDE OF 2003 BMW 320i

CRASH UPPER 313 Y-AXIS VELOCITY

PHYS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

CHANNEL -JRYV1 FILTER ON CLASS 130

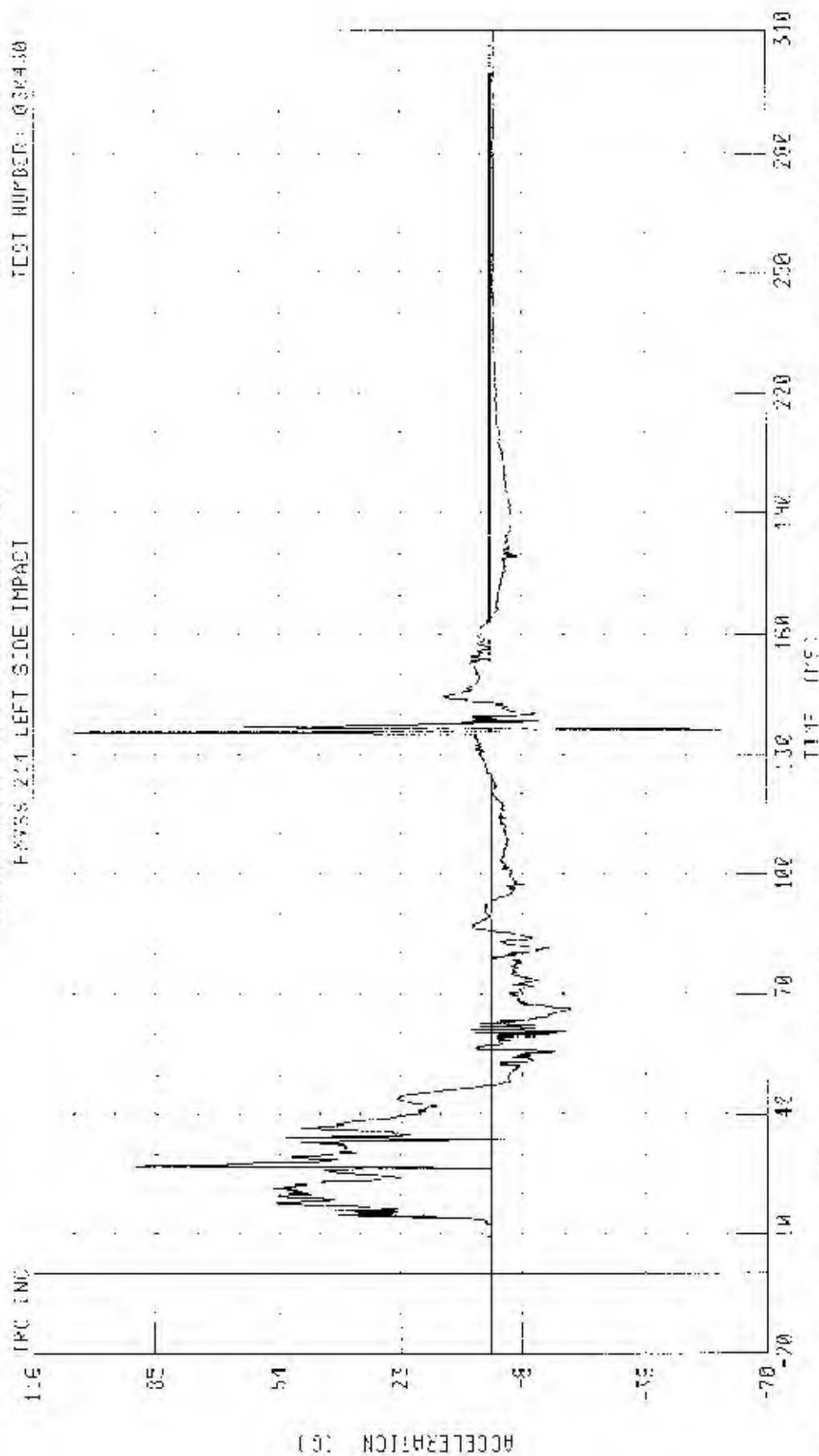
CRASH DATA 40 10 XPL 90 21 92 FS, 0 08 KPH 4 0 9 50 HS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING OFFSHOULDER BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER LOWER RIB 7 AXIS ACCELERATION

PEAK DATA: 140.16 G @ 135.28 MS, -84.21 G @ 135.52 MS

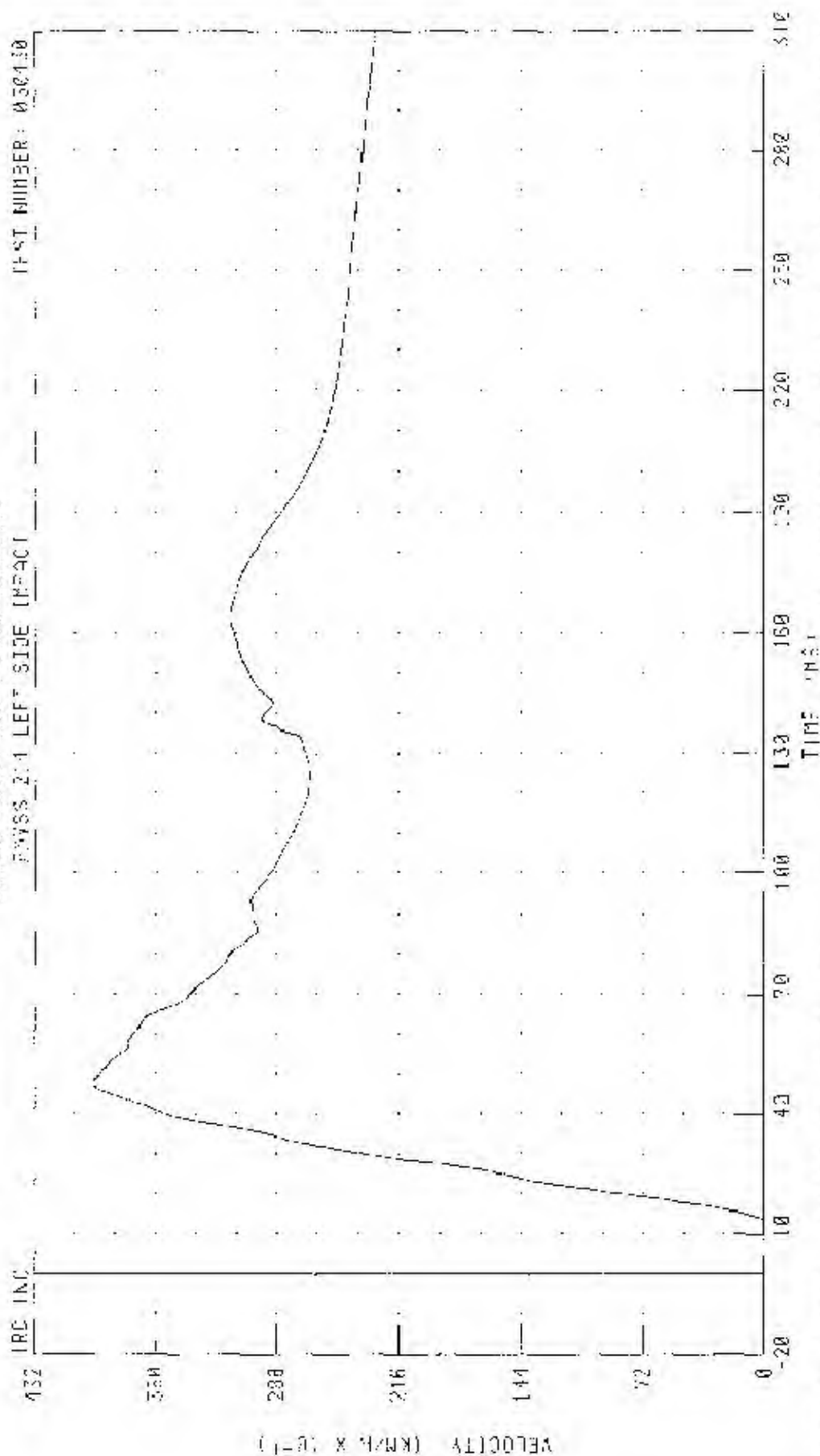
TEST NUMBER: 030430



CHANNEL: LUXG1 FILTER: 34 CLASS: 1000

55/28 KPH 40 DEGREE SIDE IMPACT (MOVING REFERENCE BARREL) 2000 LEFT SIDE OF HIGHWAY 4251

DRIVER LOWER RIB 3-AXIS VELOCITY



CHANNEL LIRYV1 FILTER 0-1 CLASS 180

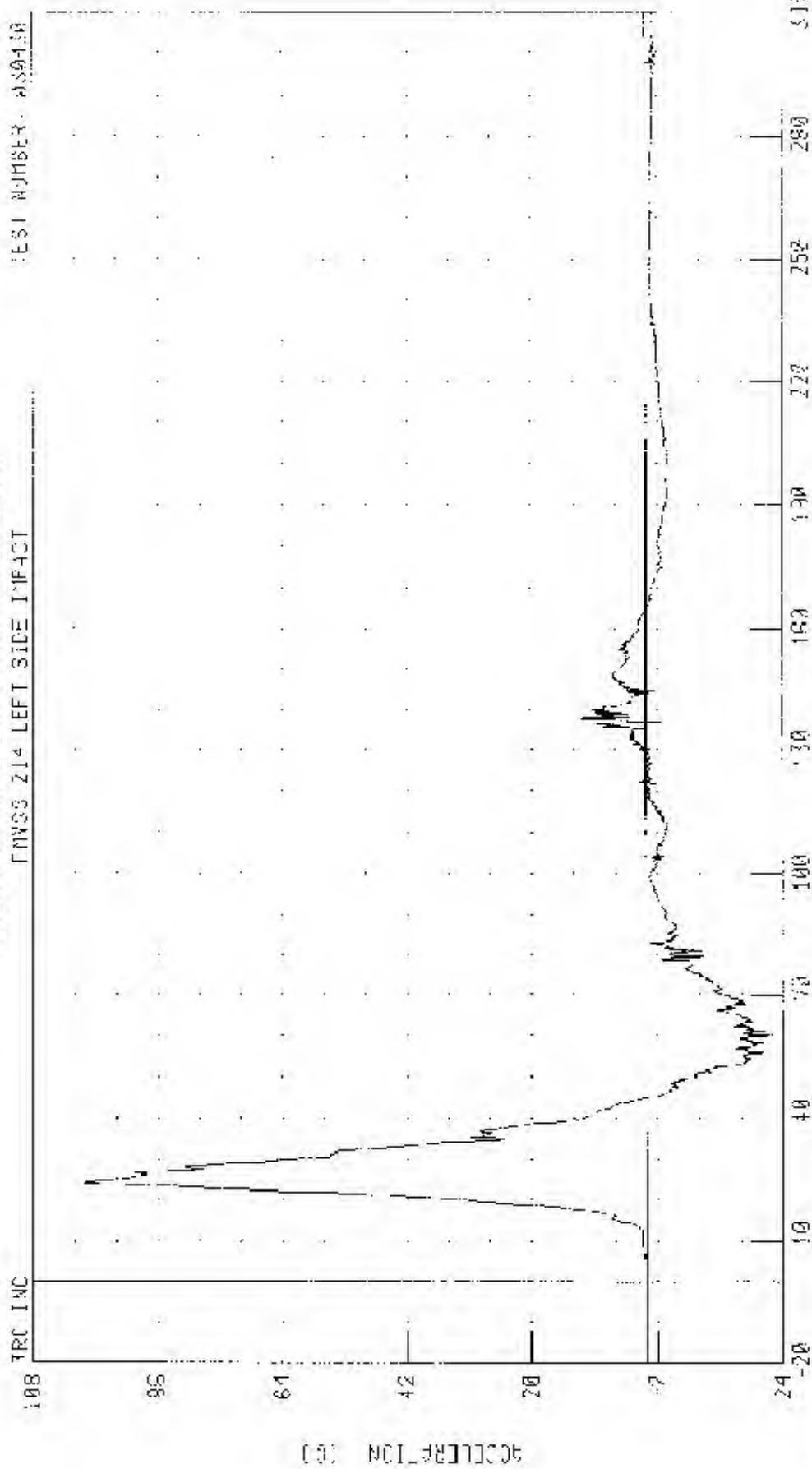
DATE DATA: 84 03 21-H W 47 44 MS: Y CW X1-F # 1 20 MS

55/28 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRELS) INTO LEFT SIDE OF 2003 RIV 3251

DRIVER LOWER SPINE Y-AXIS ACCELERATION

FNVS 214 LEFT SIDE IMPACT

TEST NUMBER: A30430



CHANNEL: 112Y31 FILTER: ON, 0.000 0000

TIME (MS)

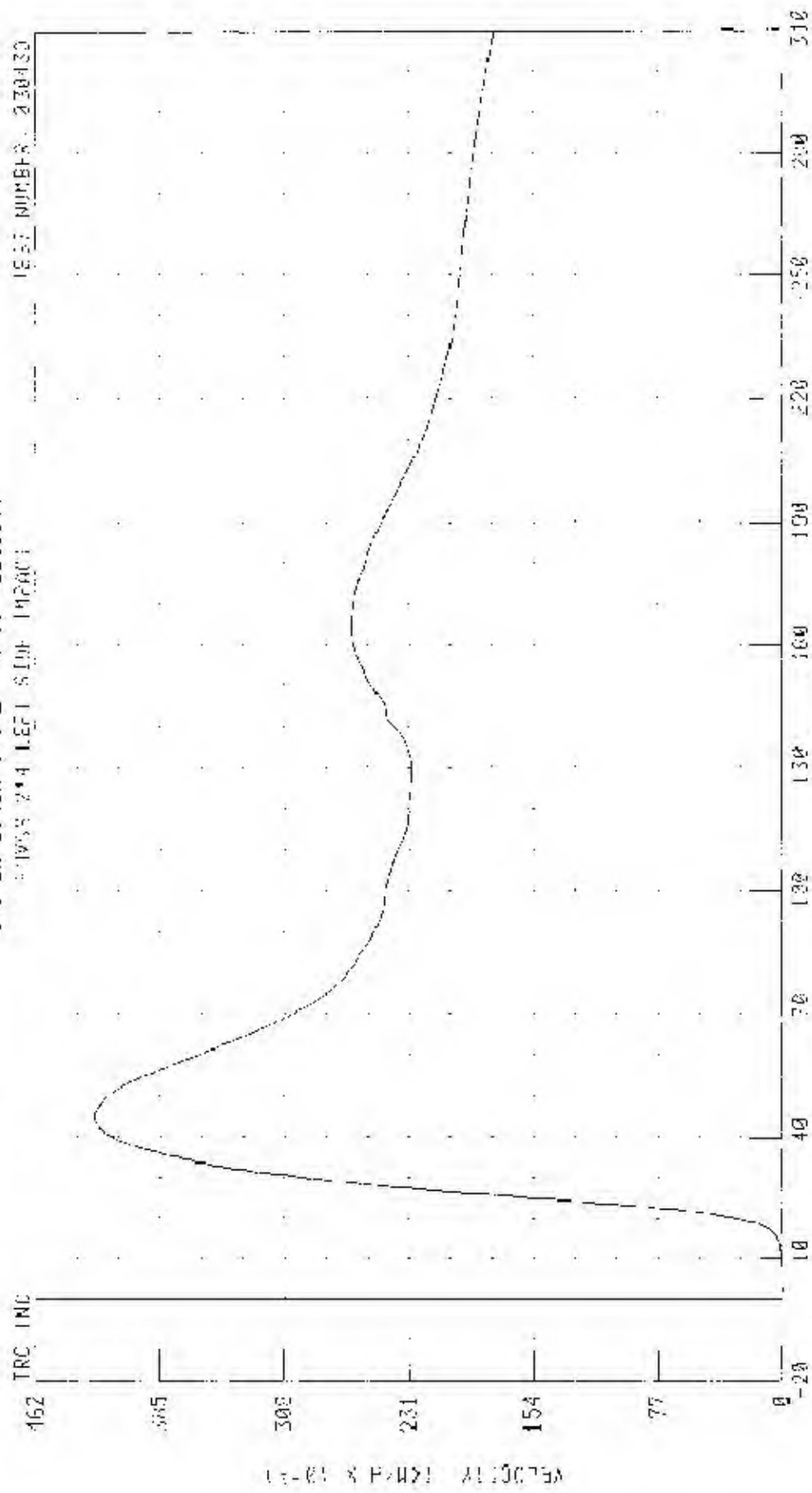
PFH# DATA 99.63 0.0 24.21 0.3 60.29 10.0

5000 KPH 90 DEGREE SLIP IMPACT INVOLVING INFANT RAIL (WARRIOR) ENJOY LEFT OF 2003 BMW 325I

DRIVER LOWER SPINE X AXIS VELOCITY

CRASH 2.4 LEFT SLIP IMPACT

TEST NUMBER: 230430



VELOCITY X AXIS (m/s)

TIME (ms)

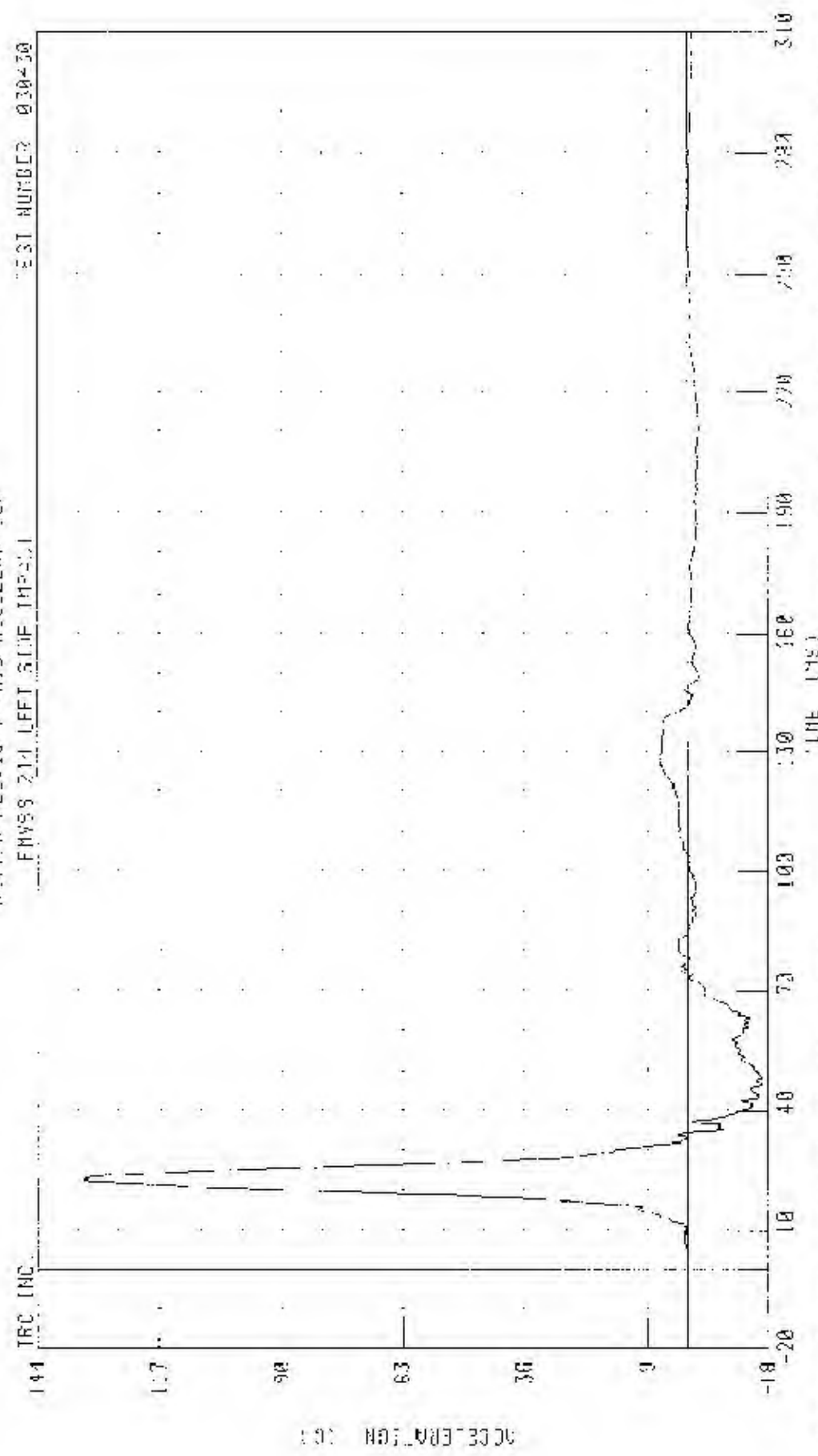
CRASH: 11.113 CH. 1000 180 FROM CRASH 2.4 KPH 90 14 90 18: 0 70 KPH 90 18 05

55/23 KPH 30 DEGREE SIDE IMPACT MOVING DEFORMER 5 BARS (F2) IN-11 FFI SIDE C- 2003 D/W 3251

DRIVER PELVIS Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL: PEVYG1 FILTER: CH CLASS: 1992

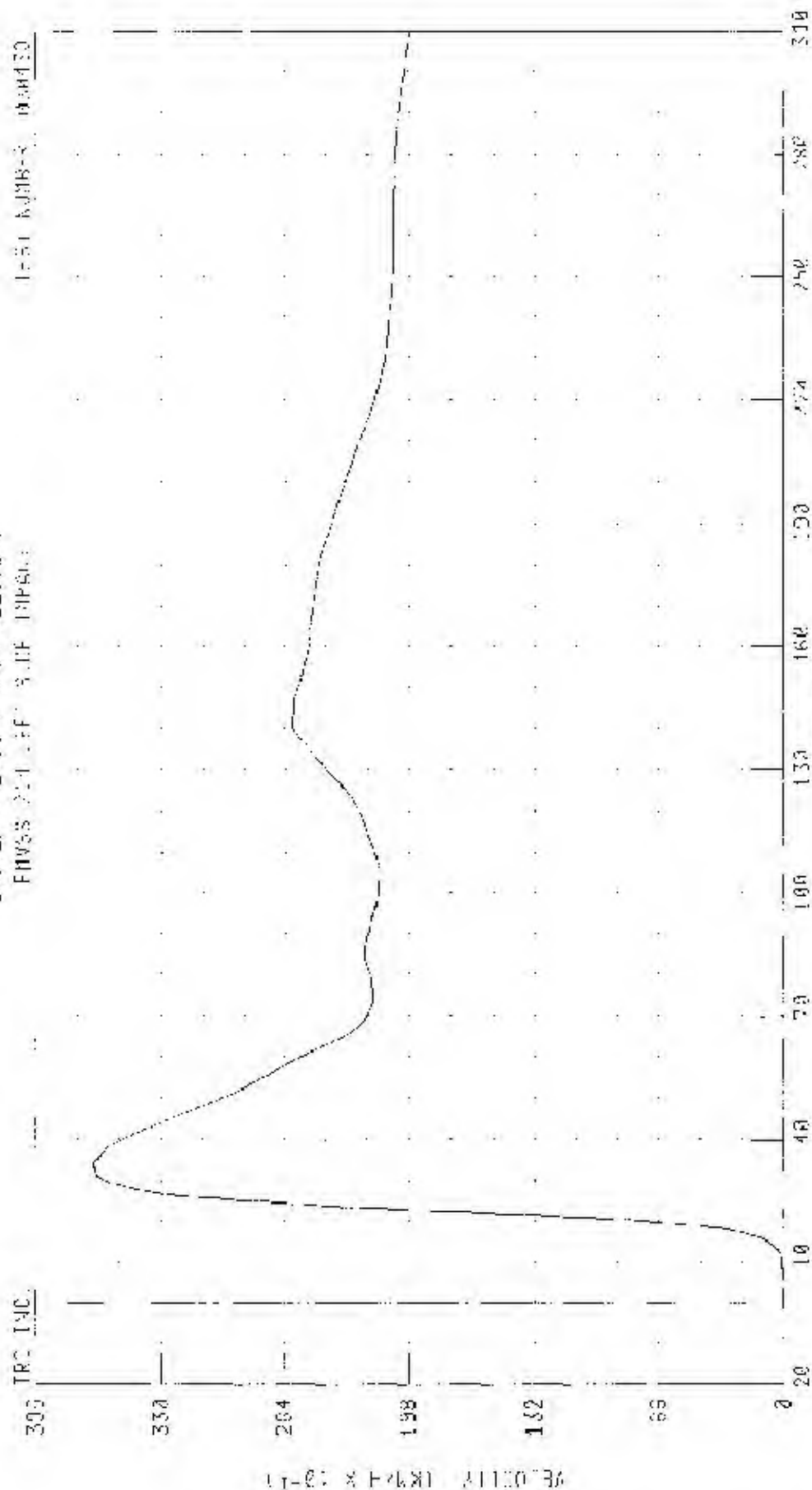
PEAK: 144.19 133.77 66.77 44.19 -13.73 0 0 48.37 115

5/1/28 KPH 300 D-CREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO I-55 I-55 IF 2003-PM 5:50

CRIMPER PELV22 V 9870 WL30117

FWVS 214.14F SIDE IMPACT

1-51 KJMB-R 000430

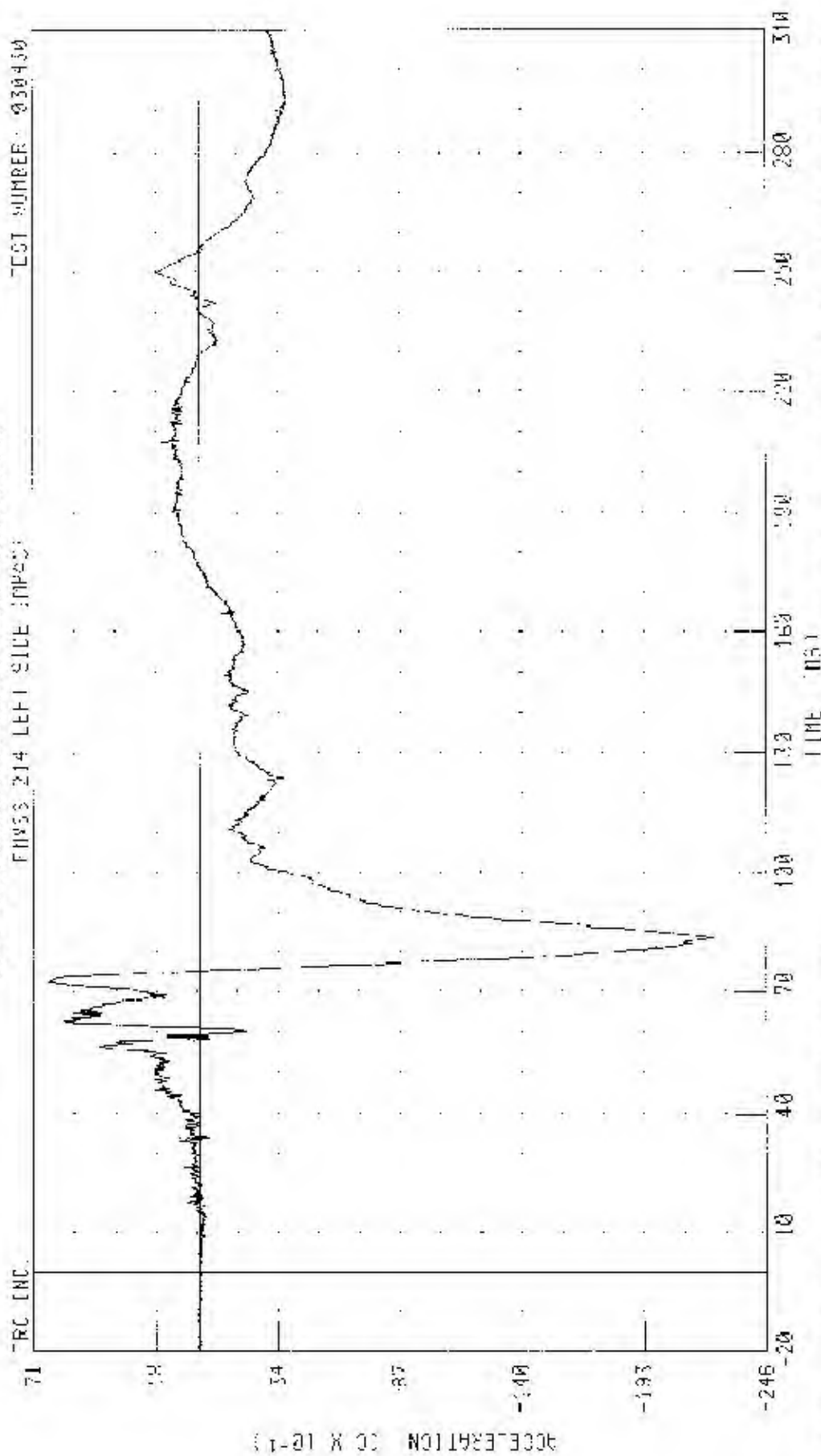


11-01 X 14.81 21110736

CHANNEL PEWV1 FILTER CH CLASS 120

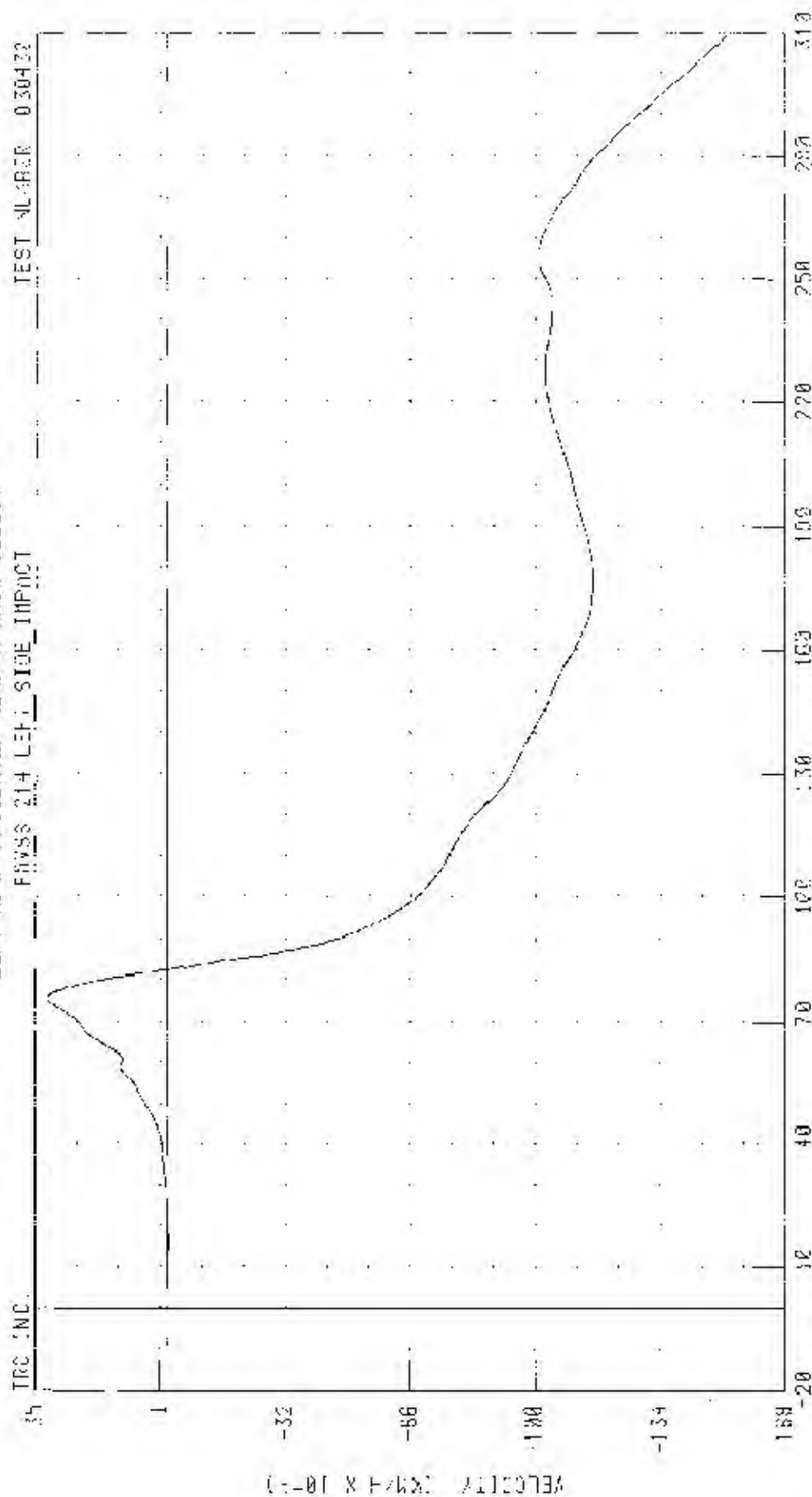
REFR LATE 50.52 PPH 2.66 8.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0 55.0 60.0 65.0 70.0 75.0 80.0 85.0 90.0 95.0 100.0

55/28 KPH 30 DEGREE SIDE IMPAC MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2305 GFW 3251
LEFT REAR PASSENGER HEAD X AXIS ACCELERATION



55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) IN A CFT SIDE OF 700X 80X 325

LEFT R248 PASSENGER HEAD X-AXIS VELOCITY



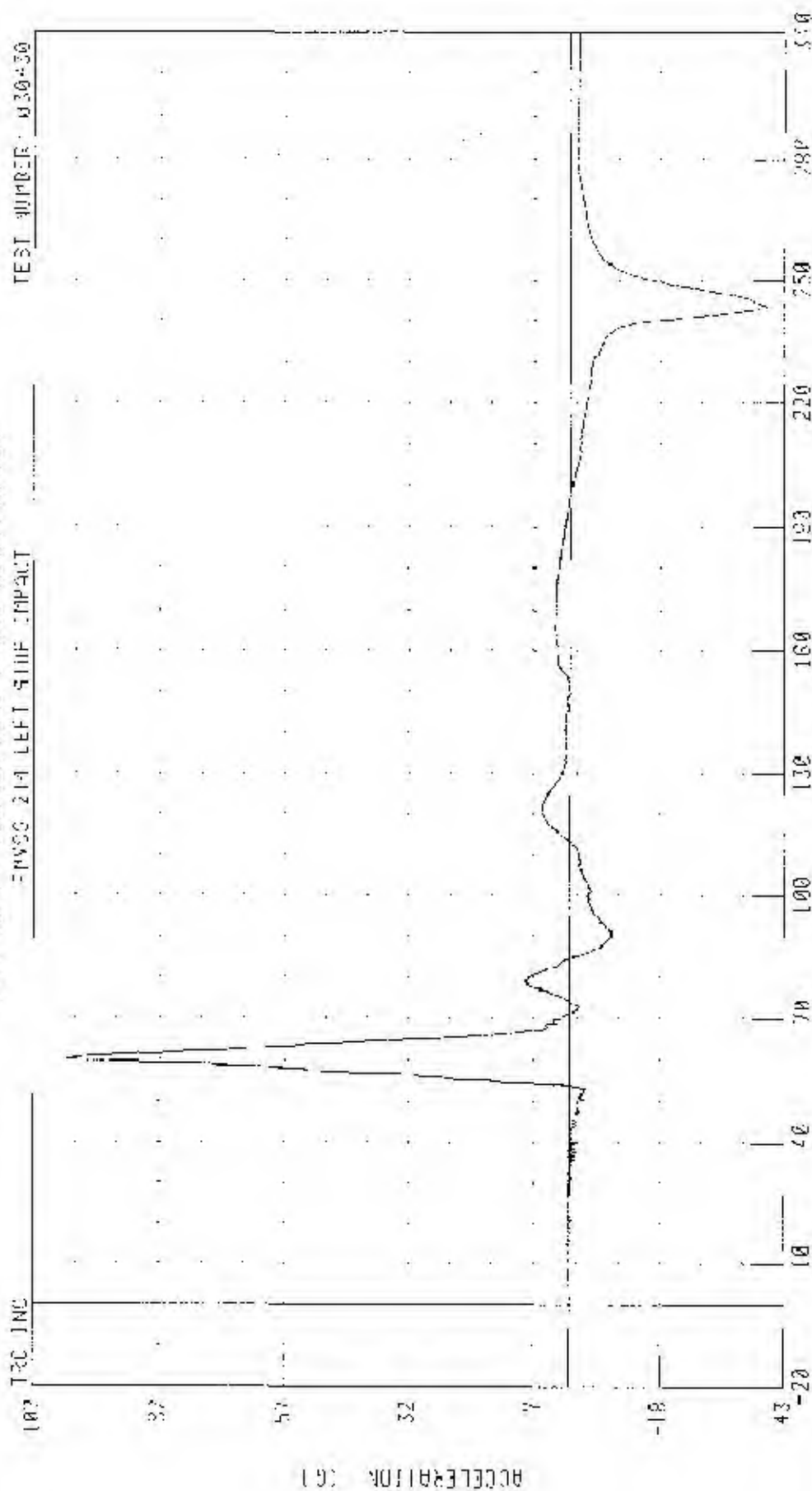
CHANNEL: H78Y4 FILTER: 0H GLOSS 180

55/28 KPH 30 FORCE STD IMPACT (LIVING DEFURABLE BARRIER) ENDO LEF S.DF OF 2003 310 7951

LEFT REAR PASSENGER HEAD (-X)IS ACCELERATION

ENVSC 214 LEFT SHIF IMPACT

TEST NUMBER: 030430



TIME (ms)

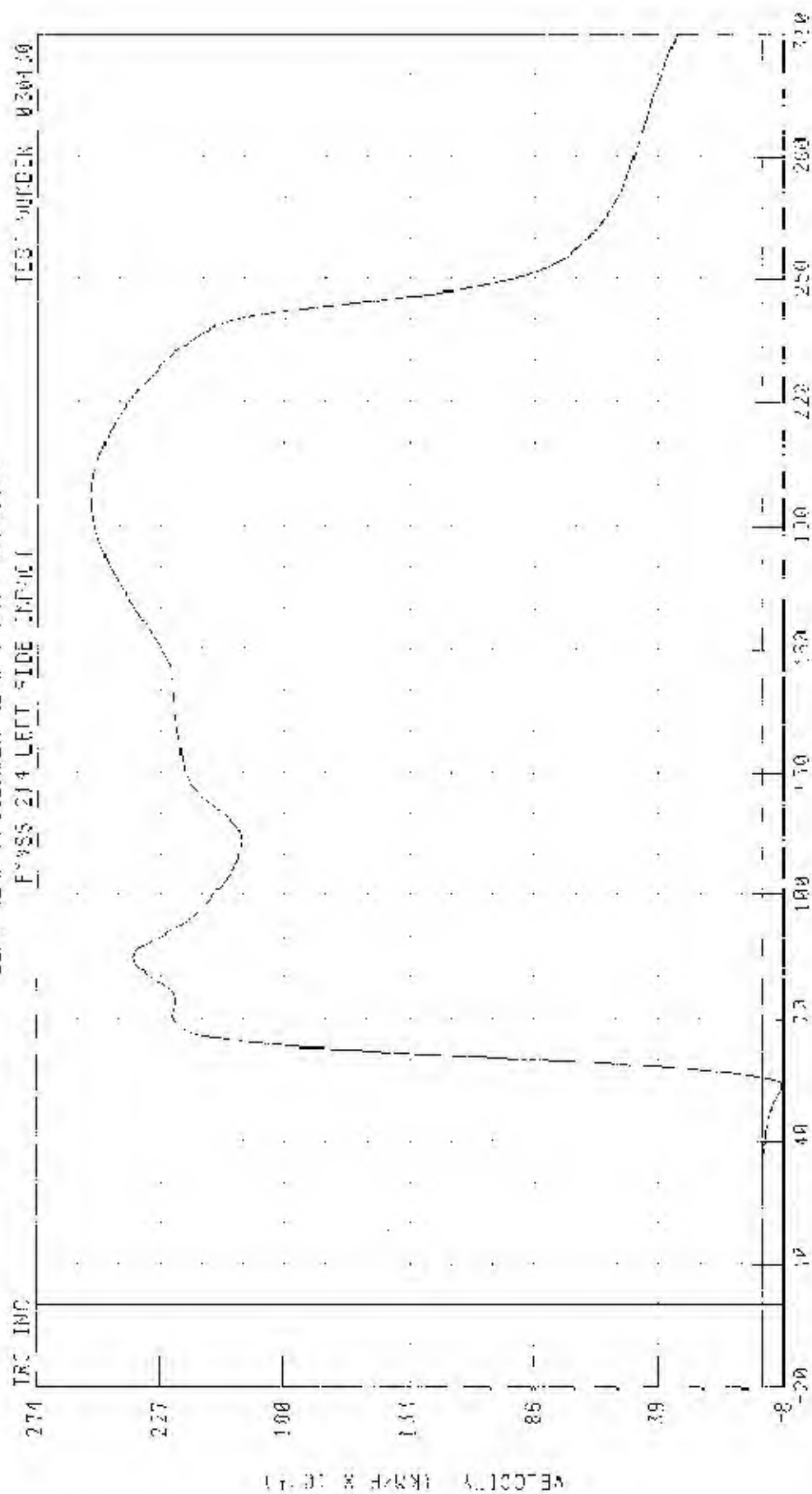
CHYNELL HLLY64 FILTER: CH GLOSS 10300

PEAK DEFL: 140 59 6 9 60 24 MS, -29 17 3 0 243 70 MS

53/20 03100 DEGREE SIDE IMPACT MOVING DEFLECTOR HORIZONTAL 1000 LEFT SIDE OF 2003 ERM 3251

LEFT REAR PASSENGER HEAD X AXIS DEFLECT

EVASS 2/4 LEFT SIDE DEFLECT TEST NUMBER 030430



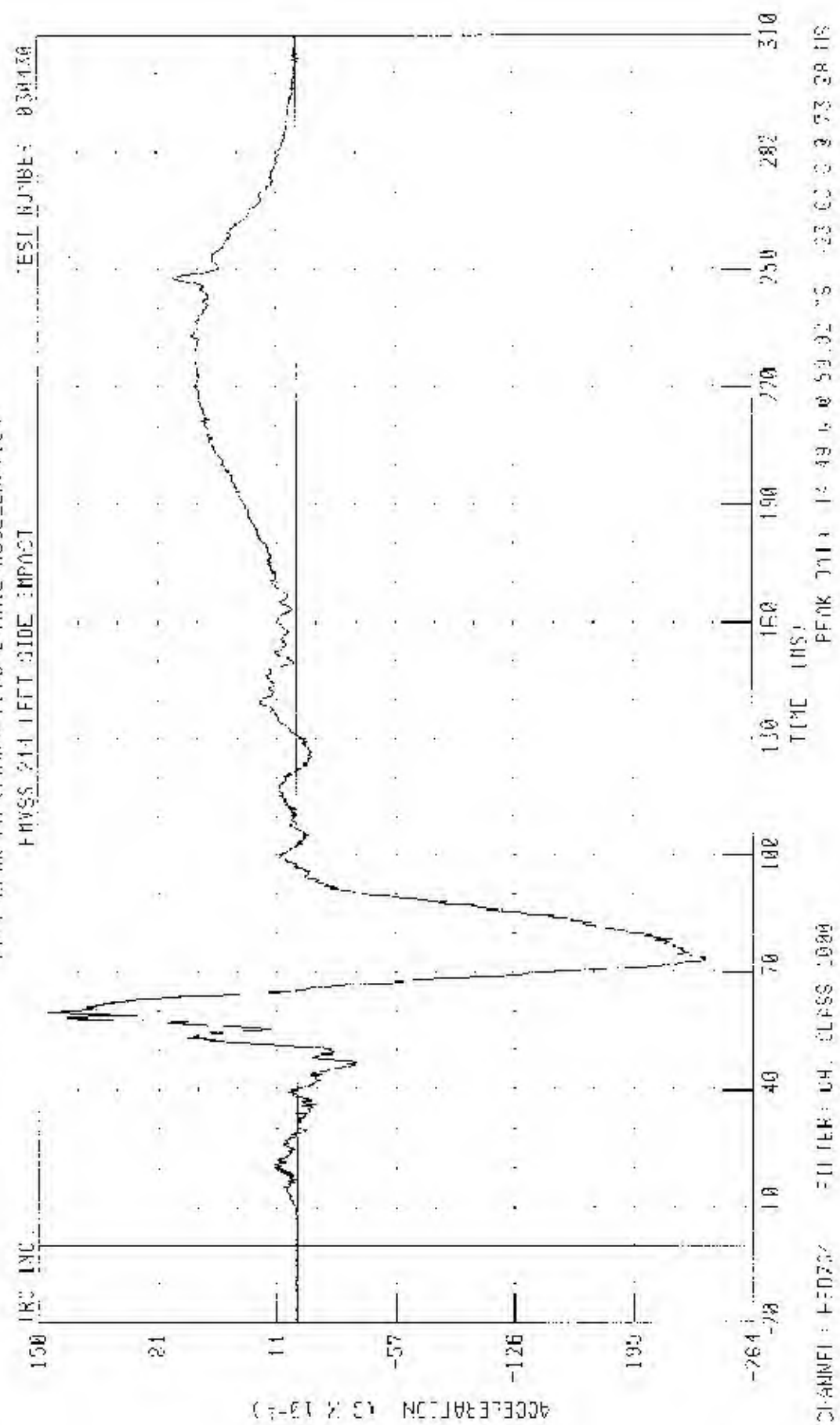
TIME (MS)

CHANNEL 100/100 FILTER ON CLASS 100

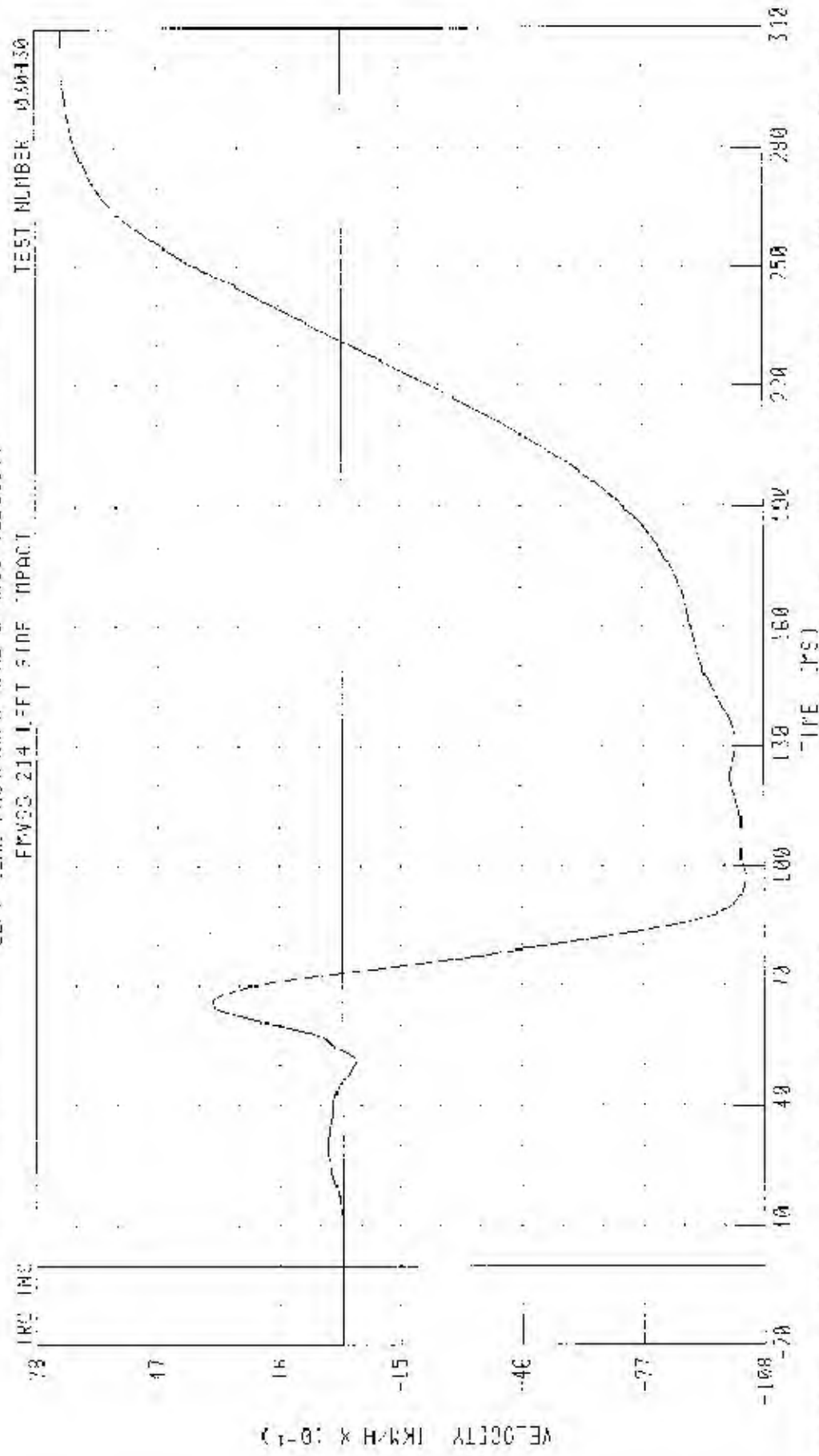
FILE NAME 05 22 21 00 137 60 00, 0 70 00 00 0 53 10 10

55-26 KPH 9M DEGRFT SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 20MS BHW 3/75

LEFT REAR PASSENGER SEAT Z-AXIS ACCELERATION



50/25 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW (25)
 LEFT REAR PASSENGER HEAD Z-AXIS VELOCITY



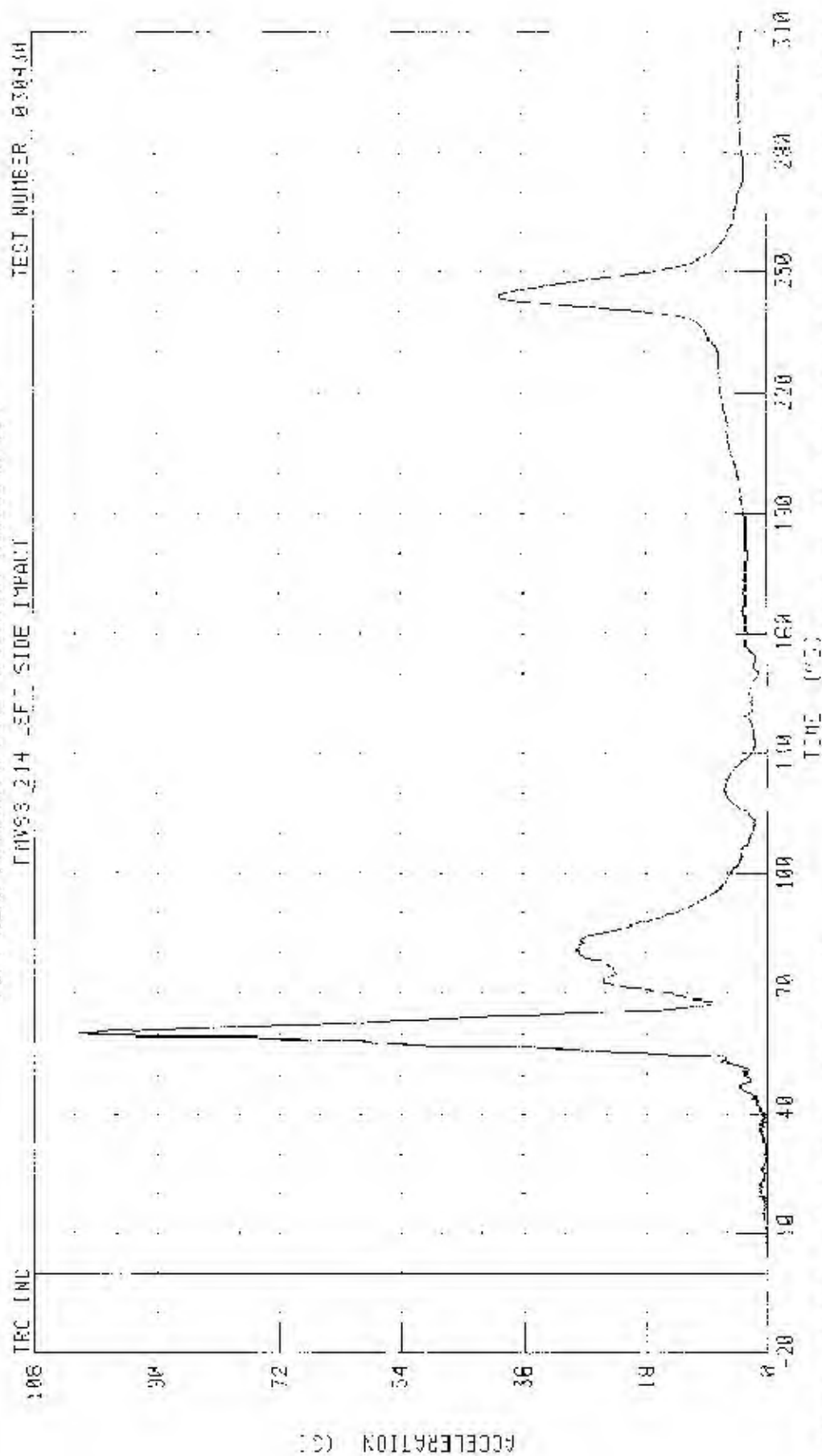
CHANNEL F=0294 L=CB 31 CLASS 18R

PCOR DATA 7 15 4114 0 310.00 MS -10.30 KPH 0 07 30 75

55/20 KPI 34 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2007 BMW 325i

LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT TEST NUMBER 030430



CHANNEL HEADG4 FILTER 100 HZ CLASS 1000

PEAK DATA 101.14 G @ 60.24 MS, 0.92 G @ 250.00 MS

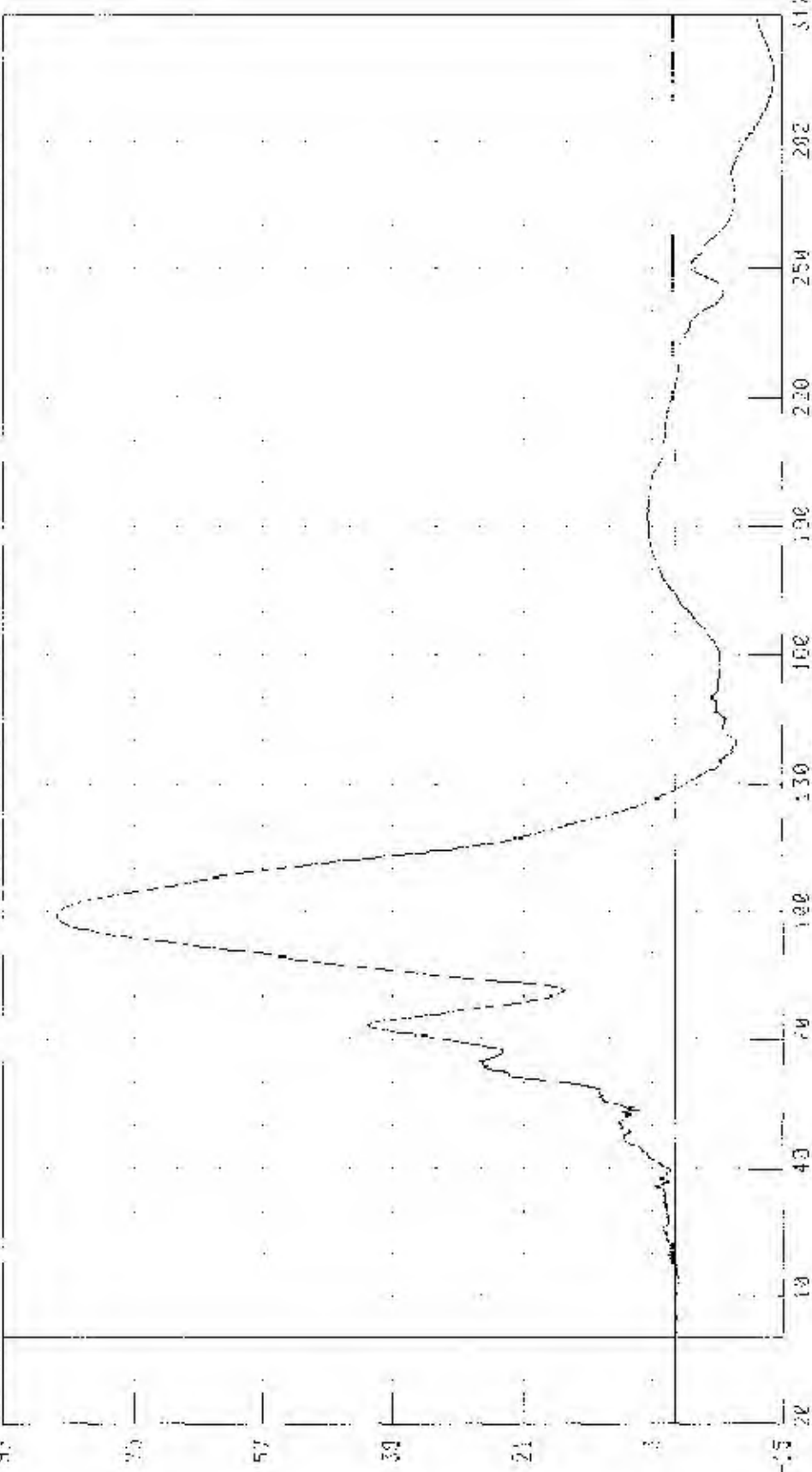
50.728 KHZ 90 DEGREE SLIP TIME: MOVING DEFORMABLE BODY: 10, 0 LEFT SIDE OF 2003 SHW 3221

LEFT REAR PASSENGER W-DK X AXIS SLAR FORCE

TEST NUMBER 030430

LVSS 001 LEFT SIDE (KPA) 1

93 TRC INC



TIME (MS)

CHANNEL: NERAE4 FILTER: CH 0 053 0000

PERF: 0.070 857.31 H 0 49.77 HZ 146.48 V 0 295 MC 1.3

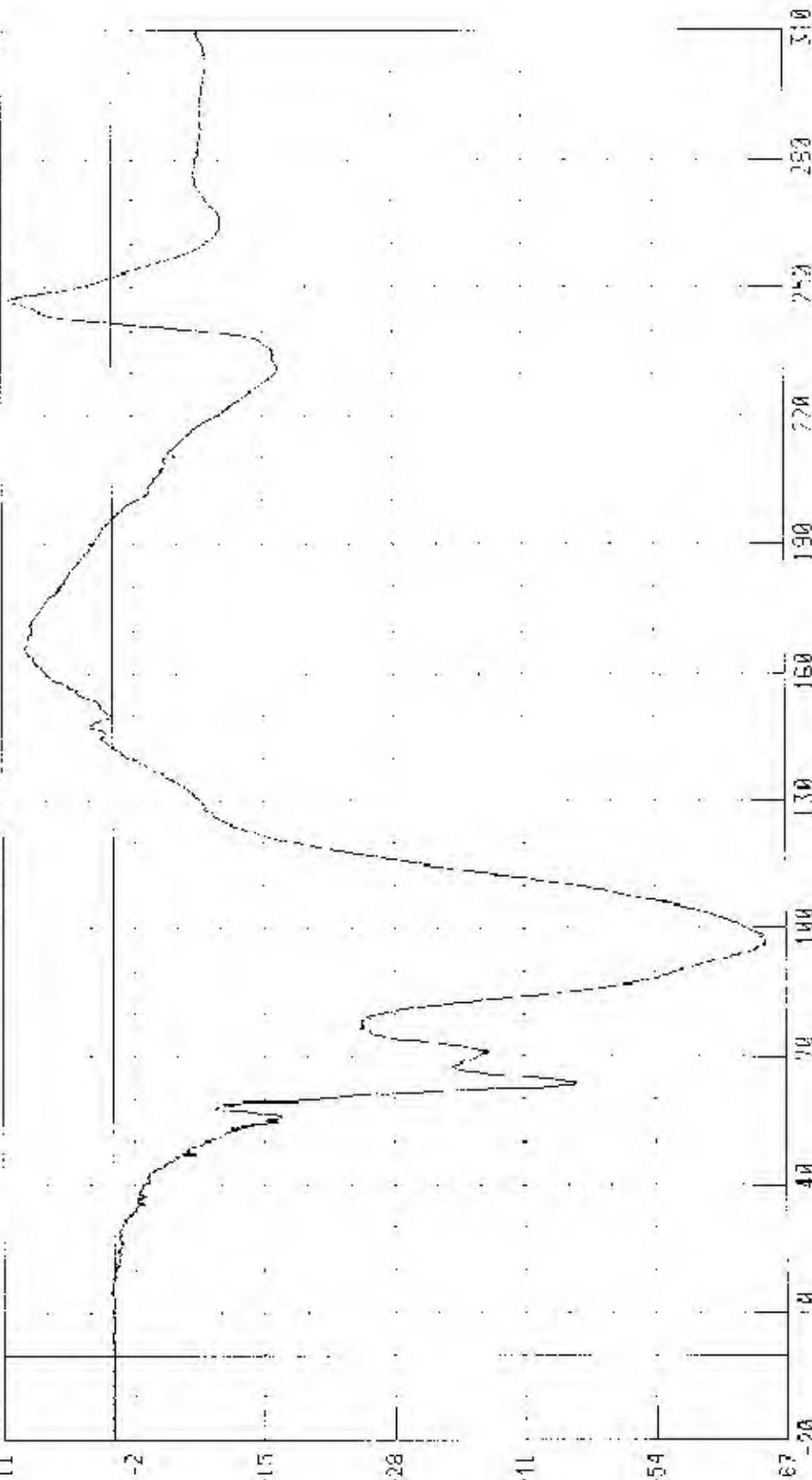
55/28 224 90 DEGREE SIDE IMPACT (MOVING IMPRIVABLE BARRIER) INTO L.H. SIDE OF 2003 BMW 325i

LEFT REAR PASSENGER N-13 Y-AXIS SHEAR FORCE

TEST NUMBER 030430

FMVSS 214 LEFT SIDE IMPACT

TRC INC



TIME (MS)

C-PMNLL HEKYP4 FILTER CH CLASS 1200

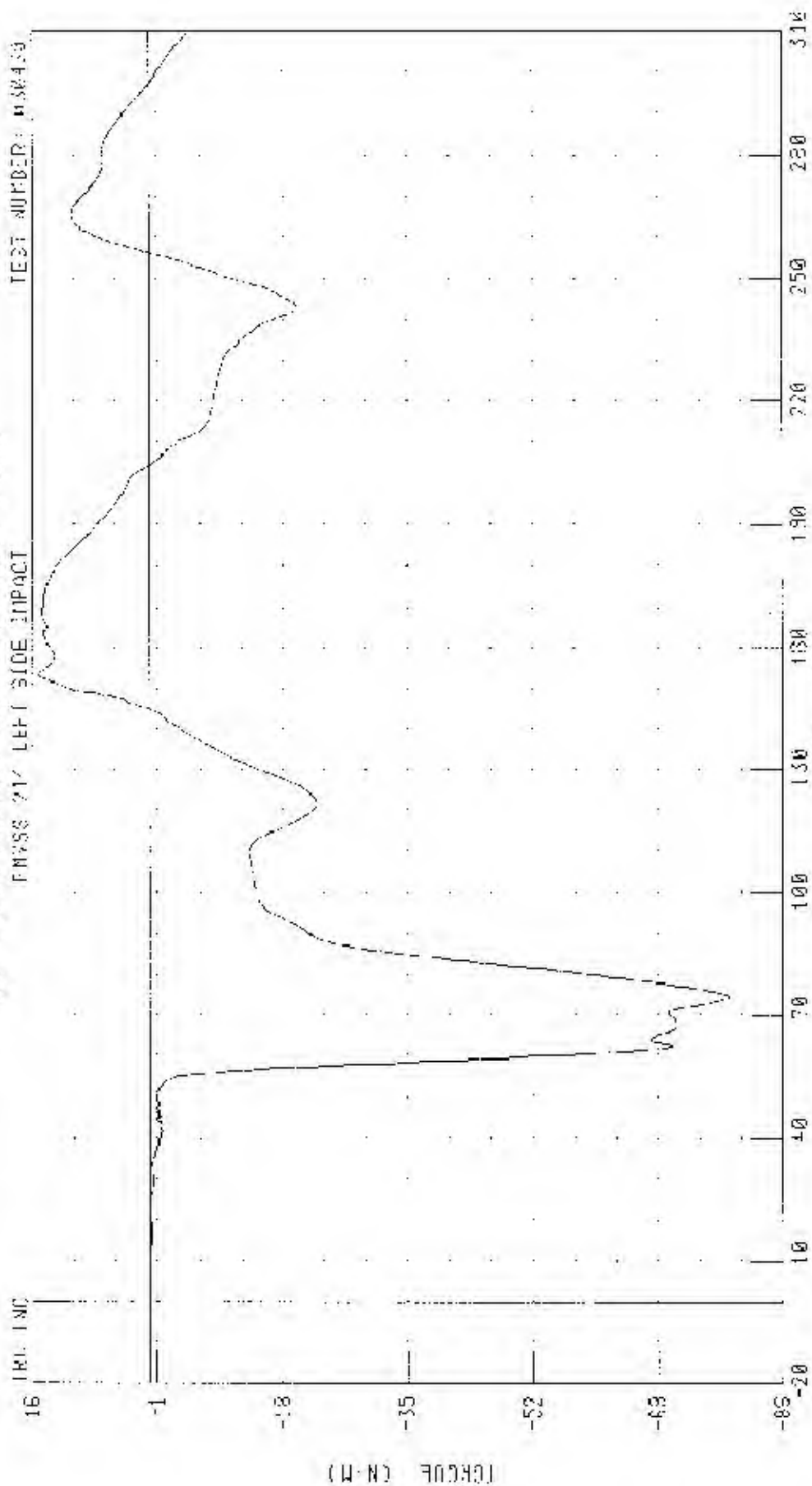
PEAK UNITS 103.53 N @ 246.88 MS, 640.00 H @ 92.84 MS

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE SURFER) INTO LEFT SIDE OF JUNKS HWY 425

LEFT REAR PASSENGER NECK JOINT ABOUT X AXIS

FM355 21/ LEFT SIDE IMPACT

TEST NUMBER: 030430



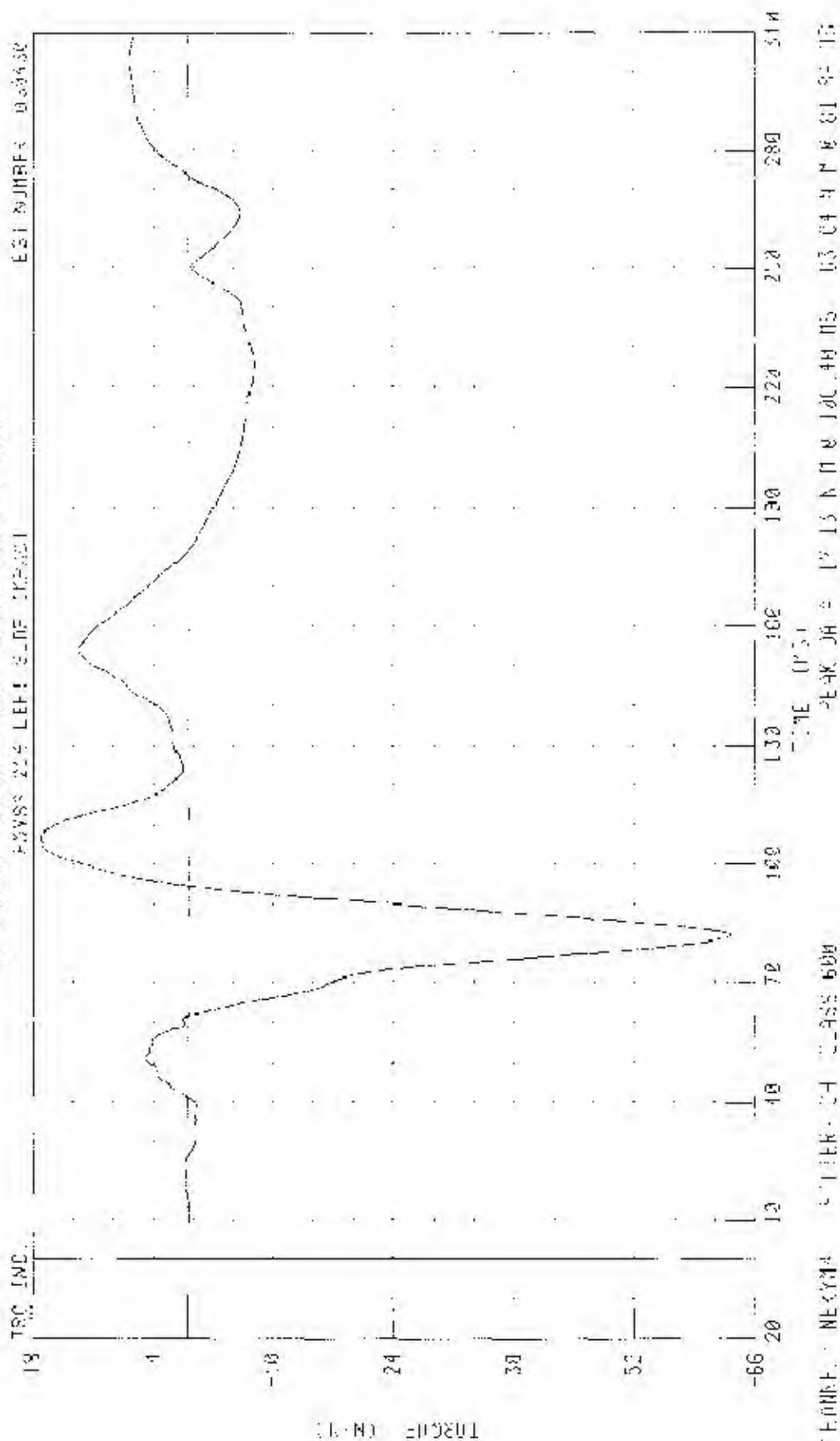
TIME (MS)

CHANNEL: NEKX11 FILTER: 24 CLASS: 003

PEAK DATA: 15.15 N-M, 157.52 MS, -79.61 N-M, 74.94 MS

55/28 KPH 92 DEGREE SIDE 14790 MOVING DETECTABLE BARSTERS IN 17 4-1 SIDE IN 2203 AMW 0751

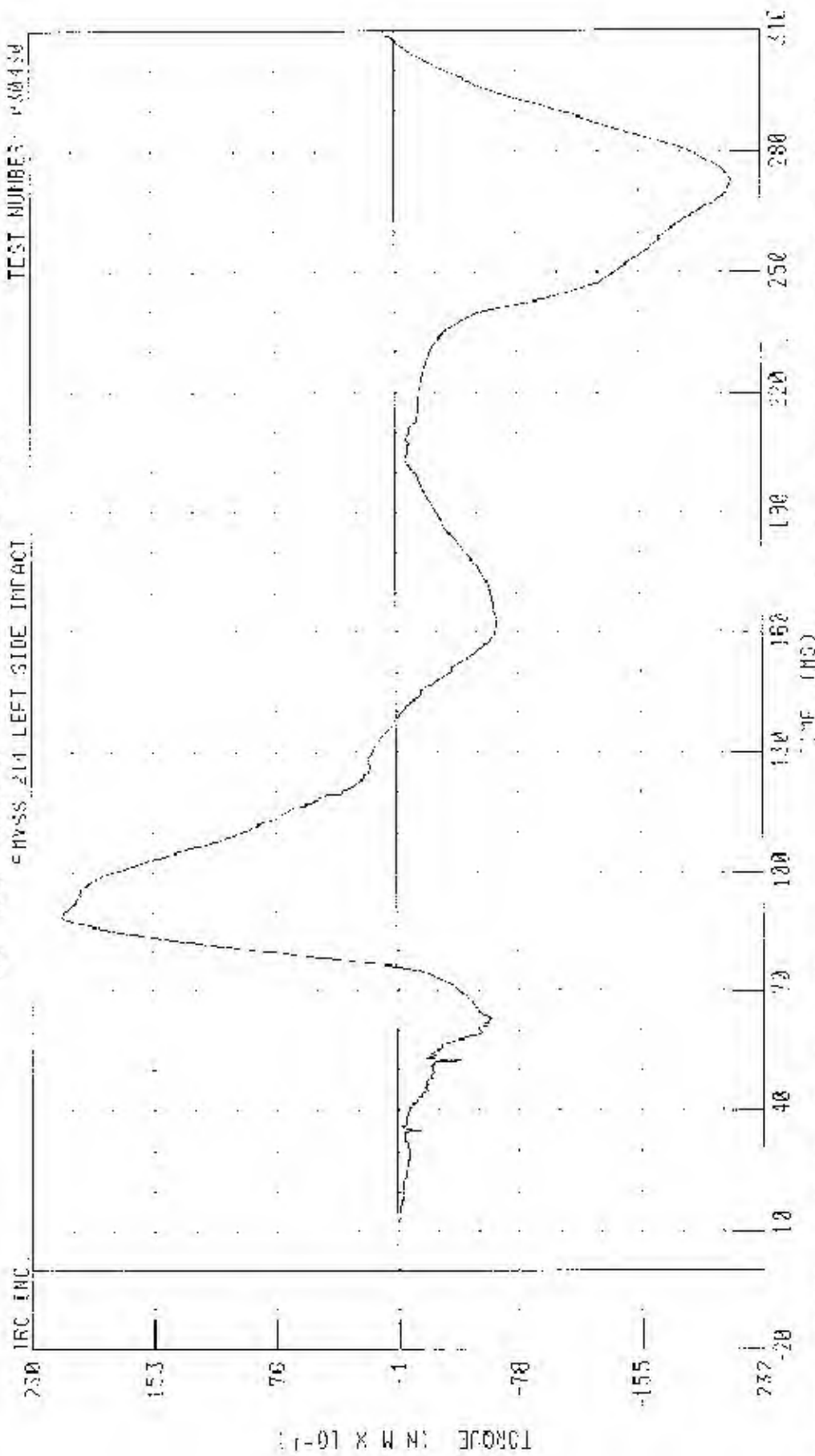
LEFT REAR PASSENGER NECK MOVEMENT ABOUT Y AXIS



FORCE: NECKM4 CUTTER: CH CLASS 600

55/26 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 DODGE STRATUS

LEFT REAR PASSENGER WHEEL MOMENT ABOUT Z AXIS

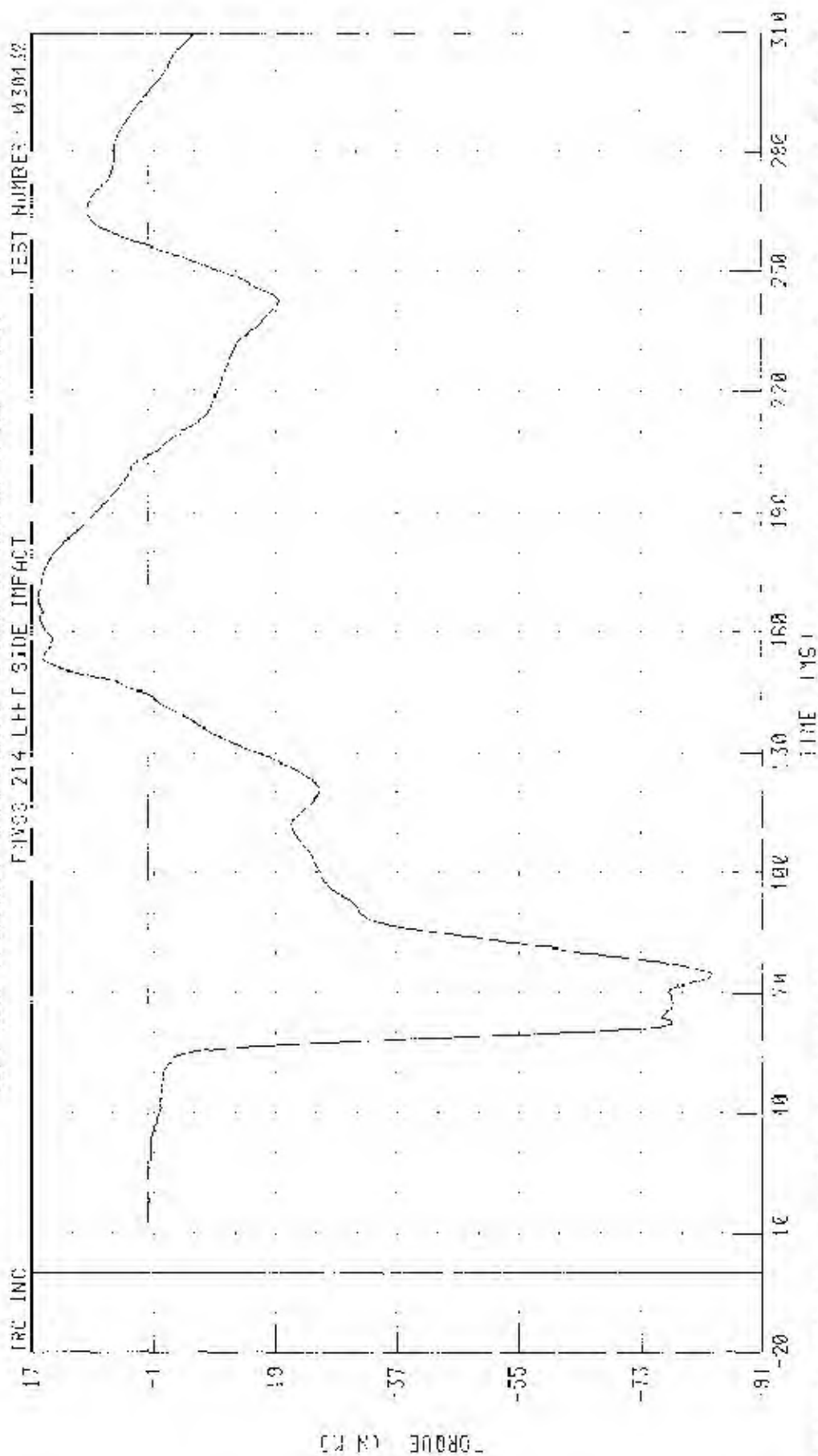


CHANNEL: NF4714 FILTER: CH CLASS: 800

PEAK DATA: 21.16 N H Q 33.72 MS: -21.30 N H Q 272.96 MS

35028 KP, 90 DEGREE SIDE IMPACT CYCLING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 BMW 325I

LEFT REAR PASSENGER SEAT OCCUPANT, CONDYLAR JOINT FROM X AXIS



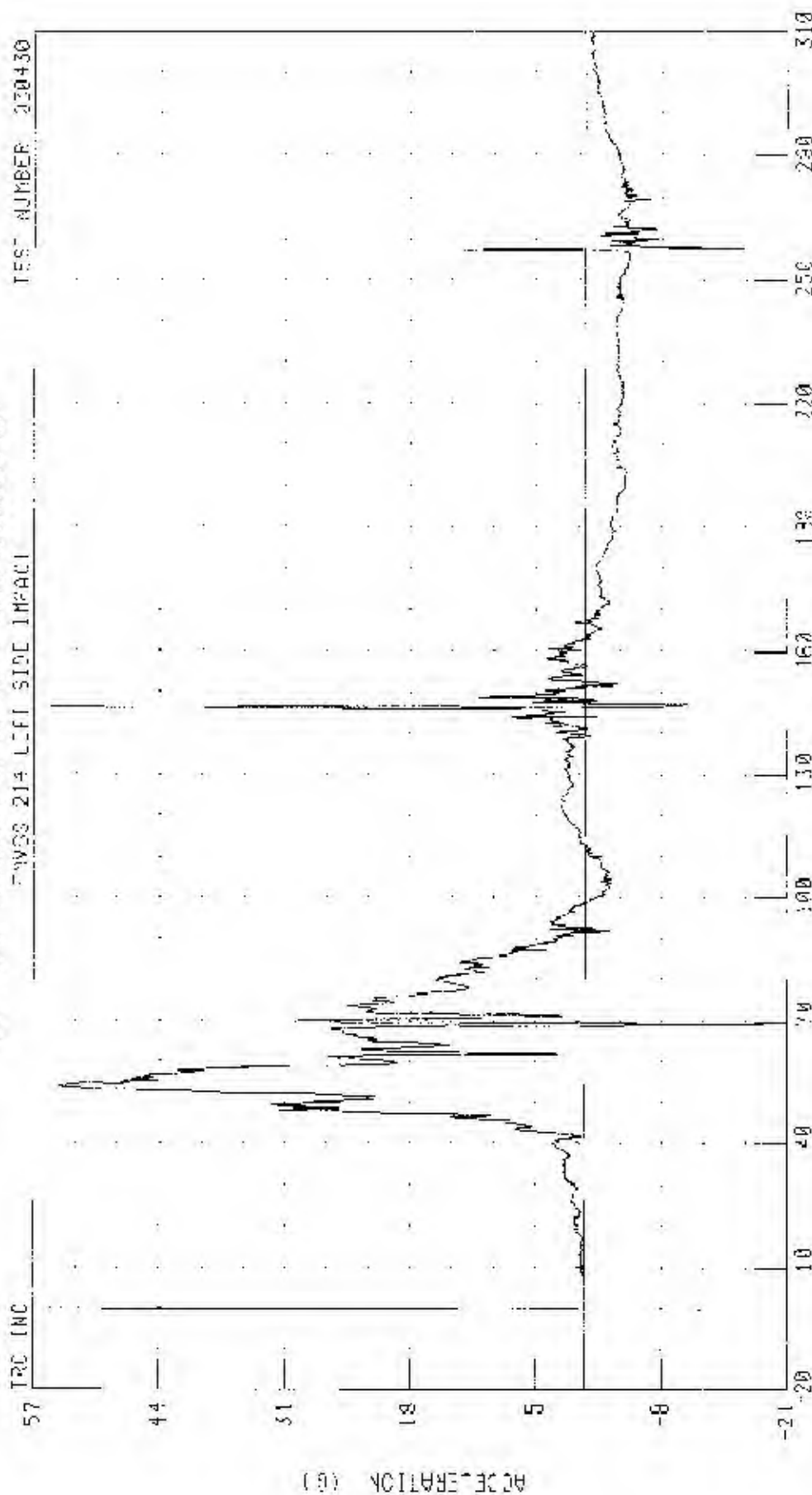
CHANNEL: NK0X14 FILTER: CIL PASS 690

TIME (MS)

PEAK DATA: 10.714 MM 100.88 MS 83.55 N 13.74 55 MS

55.23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 HW 325)

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION



CHANNEL: LURVCH FILTER: CH CLASS: 1000

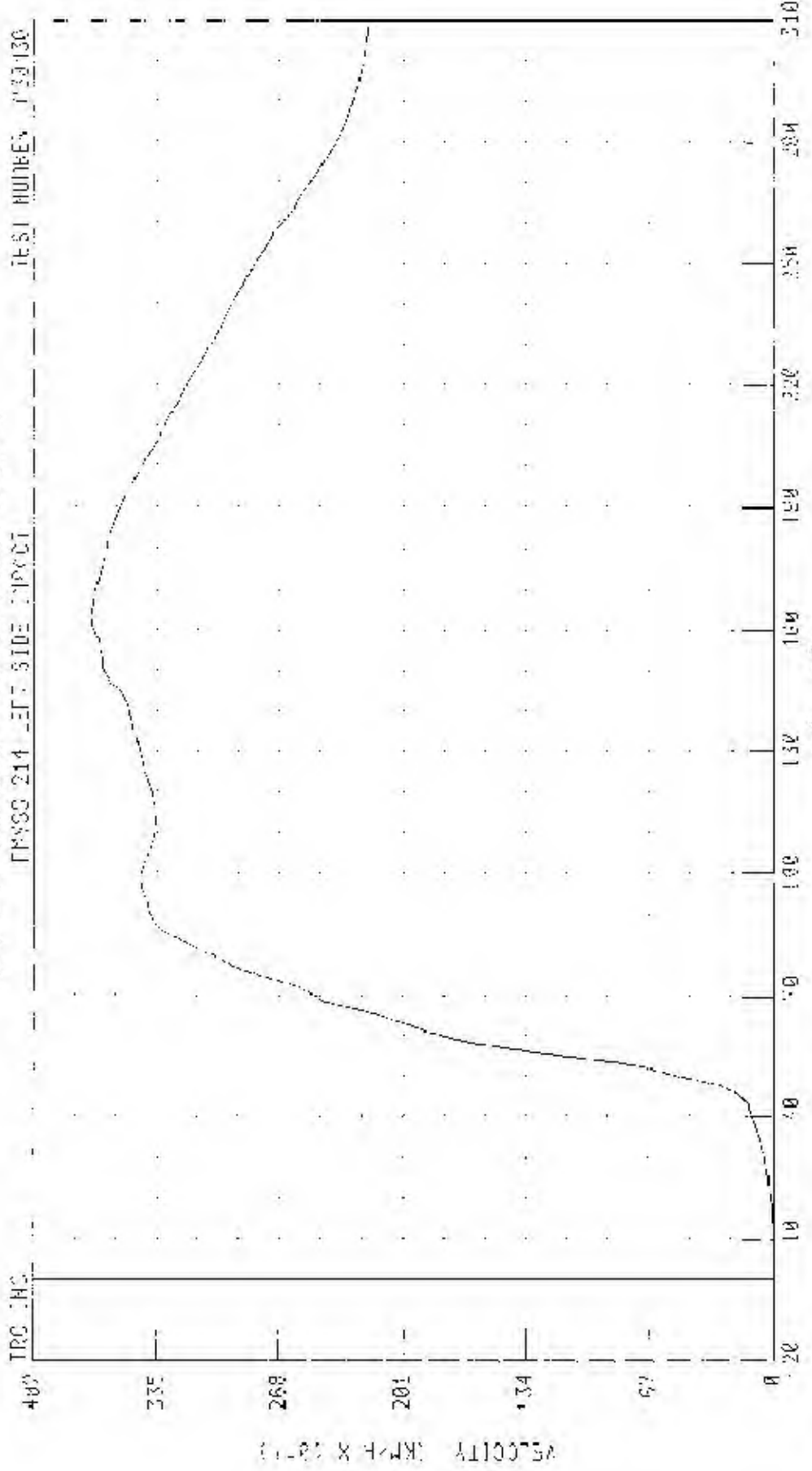
PEAK DATA: 55.40 G @ 100.00 MS, -15.17 G @ 29.52 MS

55-20 MPH 90 DEGREE SIDE IMPACT DOWING DEFORMABLE BARRIER INTO LEFT SIDE OF 2007 BMW 325i

LEFT REAR PASSENGER DOOR R/H V-DASH VELOCITY

TEST NUMBER 030430

FMVSS 214 LEFT SIDE IMPACT



TIME (MS)

PEAK DATA 23 07 KPH @ 123 MS @ 04 KM/H @ 0.00 MS

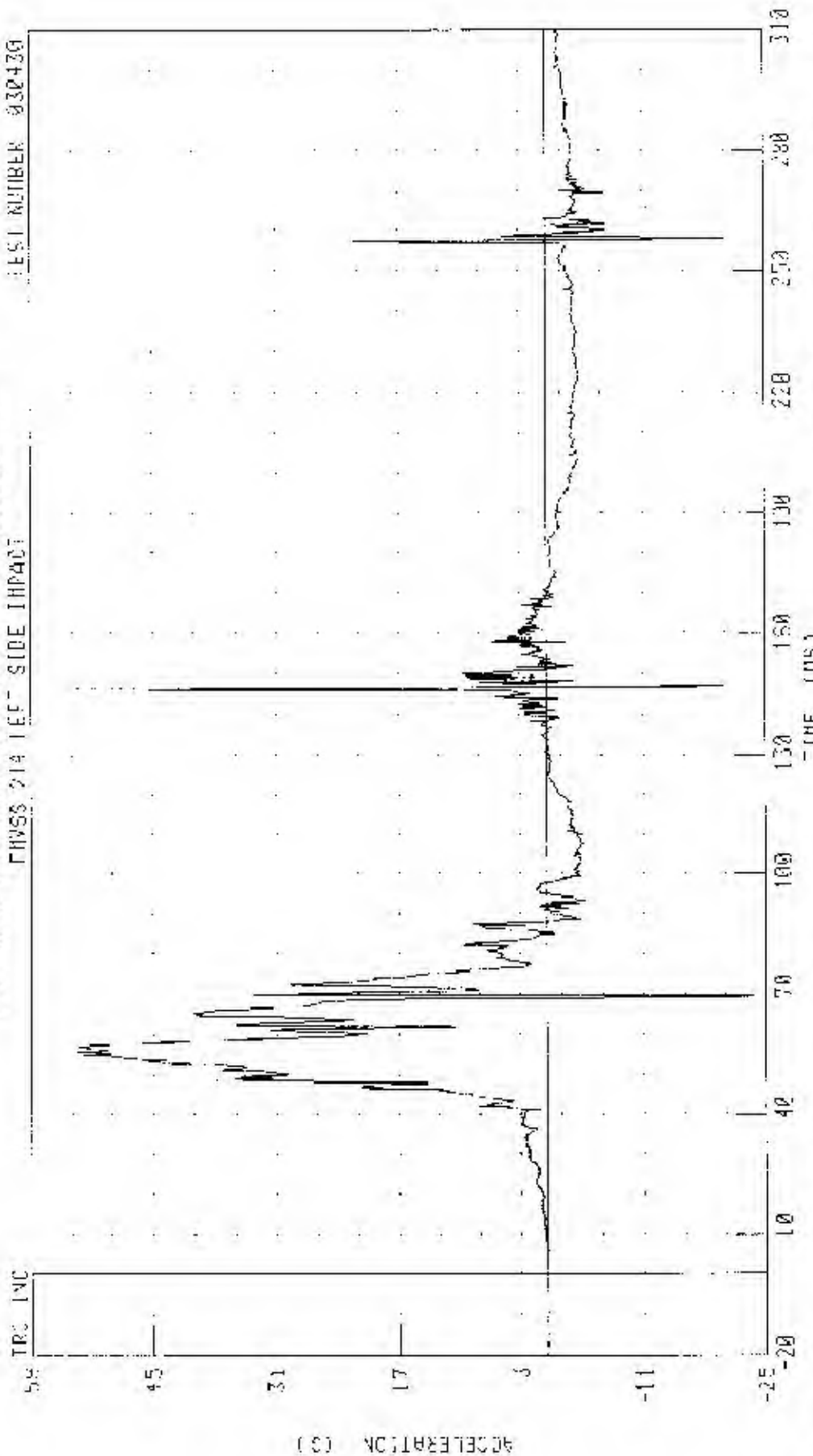
VELOCITY (KM/H) CH CLASS 100

55/20 KP4 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2043 HWY 325.

LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION

CHASS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL L2704 FILTER 0.5 CHASS 1000

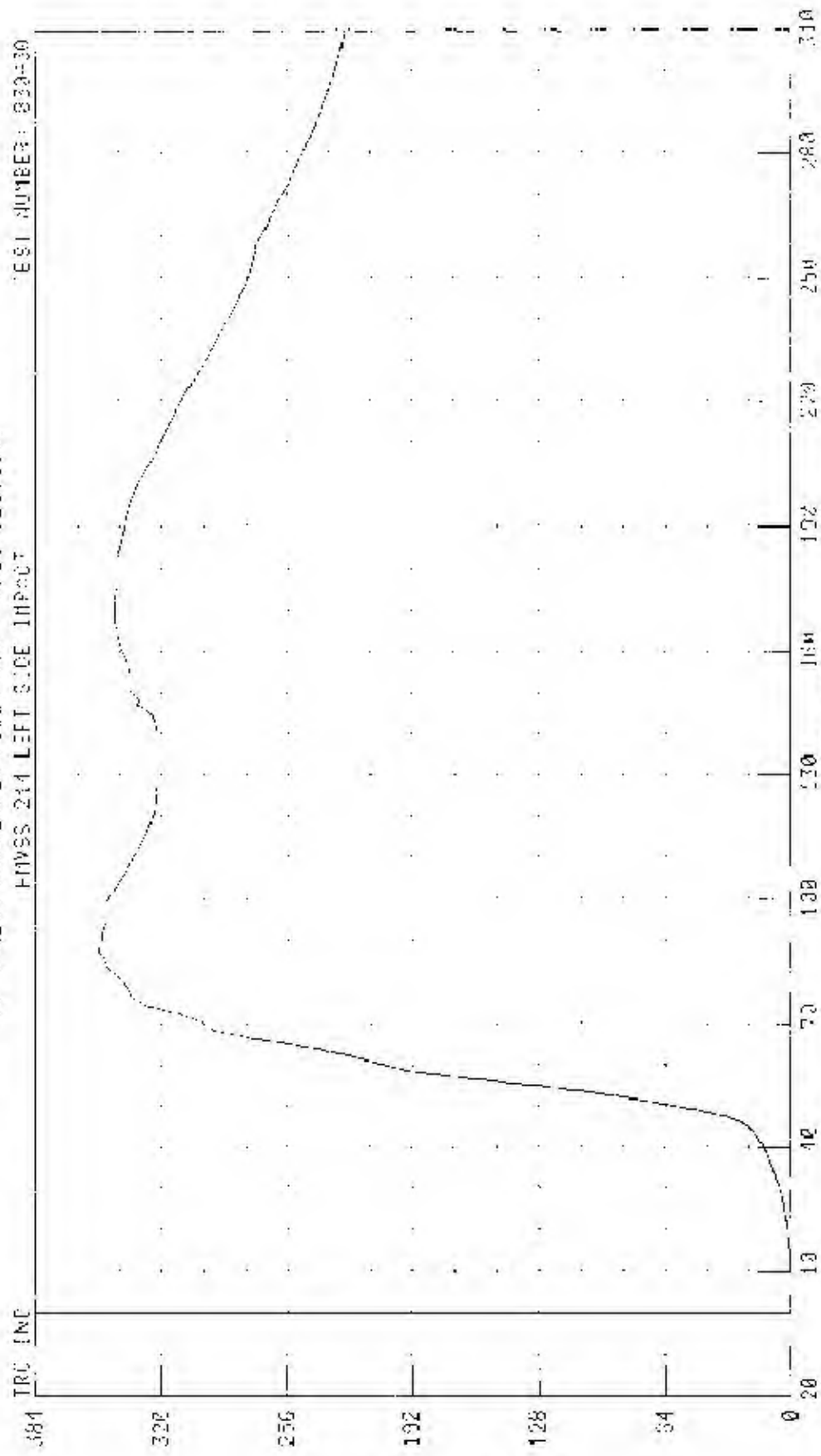
REFK L2114 05 01 00 148 53 19; -23 63 6 0 60 32 MS

55-20 MPH 90 DEGREE SIDE IMPACT (MOVING AFFORDABLE BARRIER) INT'L LEFT SIDE OF 200'S R/W 3/30/

LEFT REAR PASSENGER / OWNER R13 Y AXIS VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 8330-30



(-01 Y 148) ALLOCIA

TIME (MS)

PEAK DATA 35 18 MPH @ 38.08 MS, 0.90 KPH @ 0.90 MS

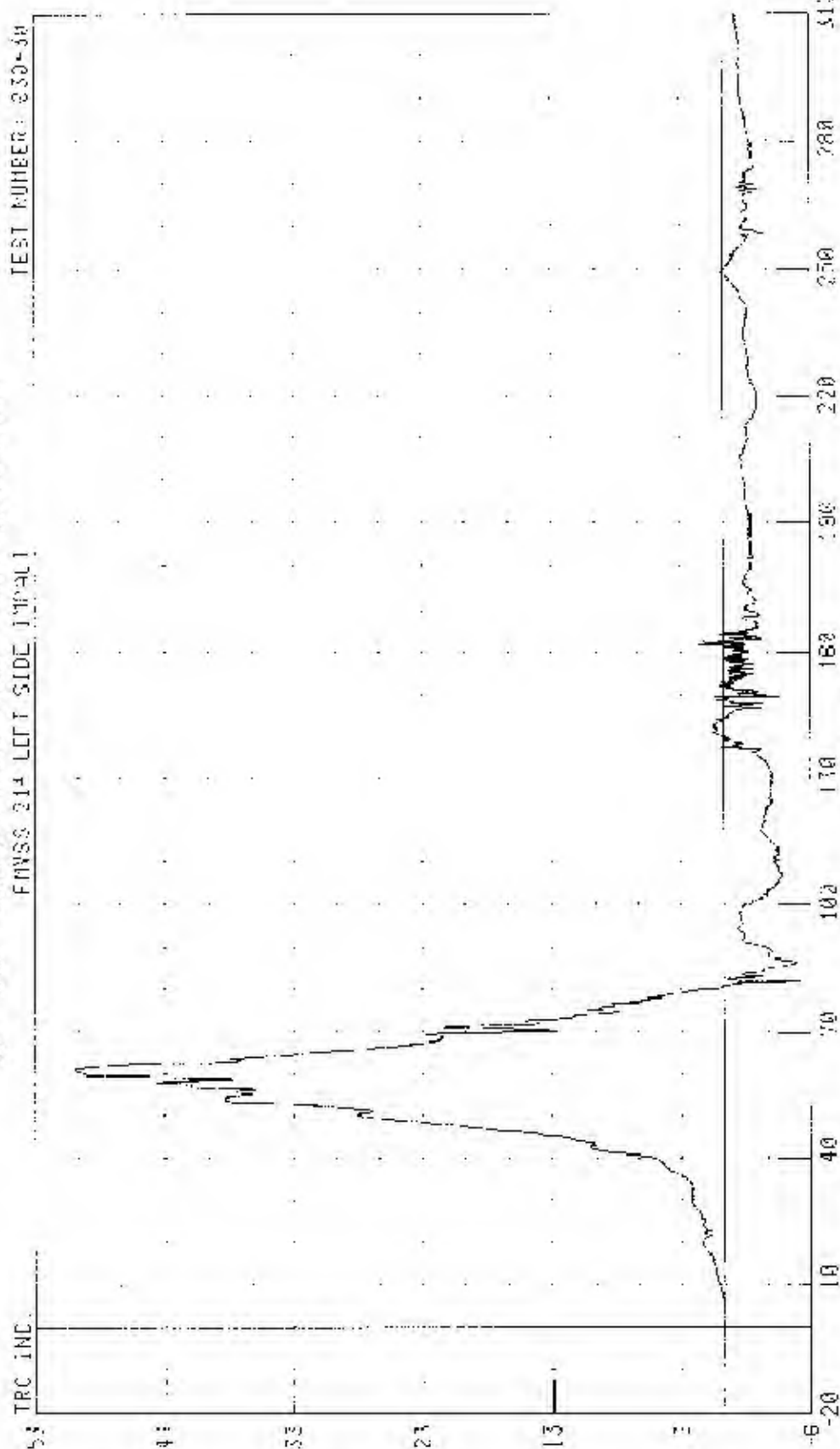
CHANNEL: LK4V4 FILTER: C3 CLASS: 184

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 HW 325J

LEFT REAR PASSENGER LOWER SPINE Z-AXIS ACCELERATION

TEST NUMBER: 030-38

FNVS 214 LEFT SIDE (TOTAL)



ACCELERATION (G)

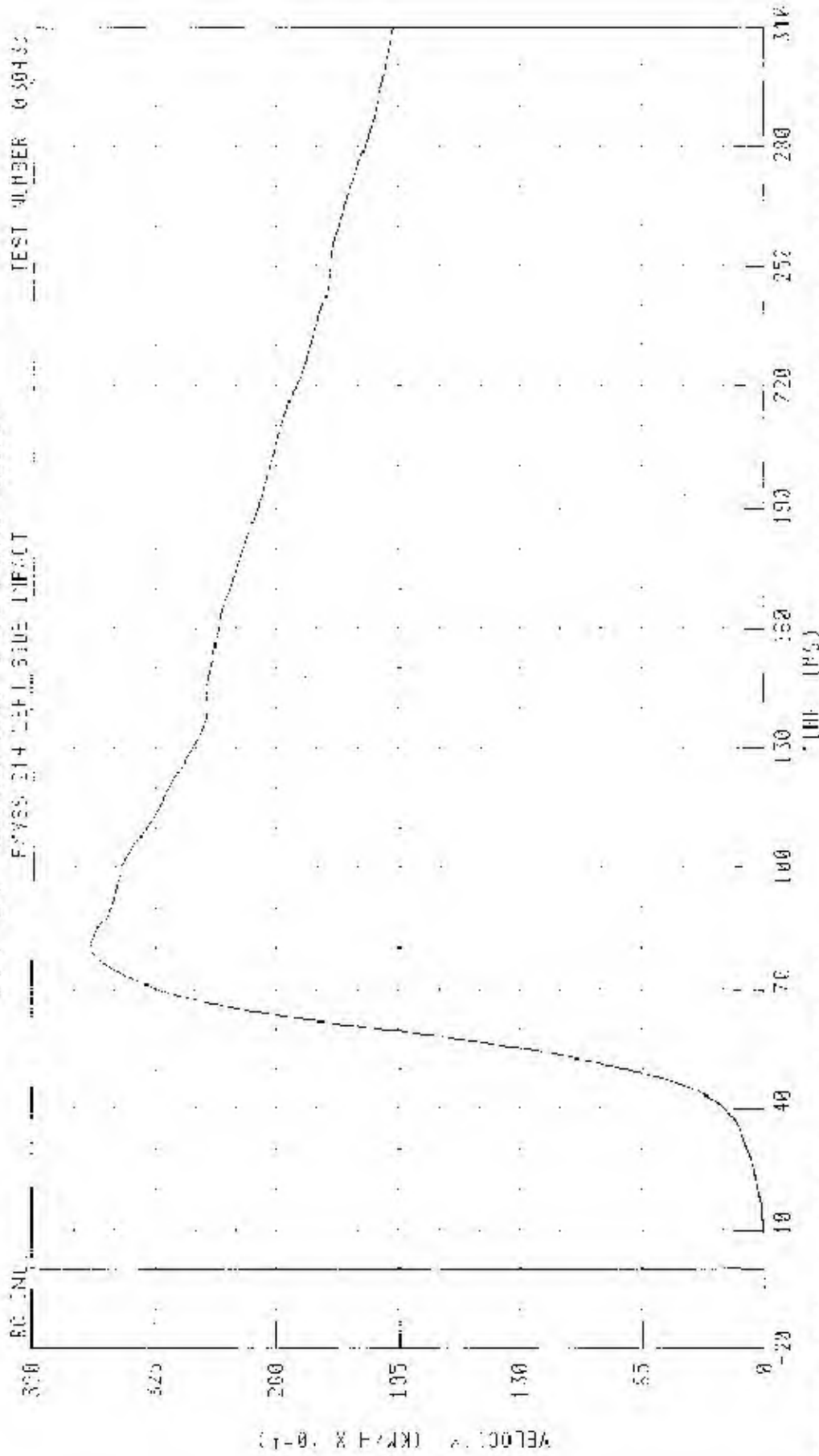
TIME (MS)

CHANNEL: 112V04 FILTER: C-1 CLASS 1000

PEAK DATA 30 35 0 0 51 28 MS -6 10 3 0 51 34 PS

55/28 MPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 BMY 325J

LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY



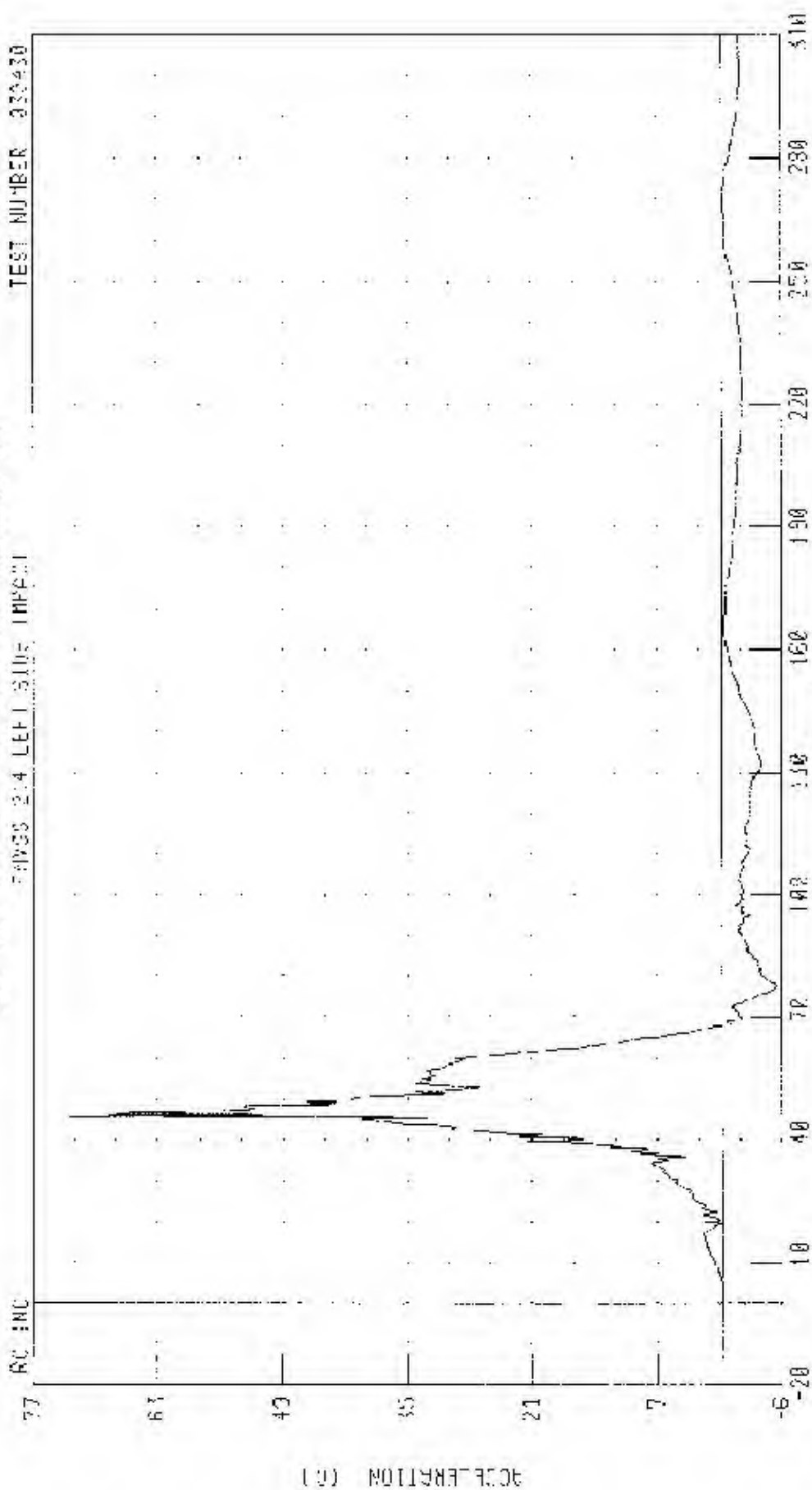
CHANNEL 112V4 FILTER CH LOSS 130

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION

TEST NUMBER 030430

EVENTS 2:4 LEFT SIDE IMPACT



TIME (MS)

CHANNEL PEVY04 FILTER CF. 0.933 1300

PEAK DATA: 77.38 G @ 45.00 MS, -6.27 G @ 77.62 MS

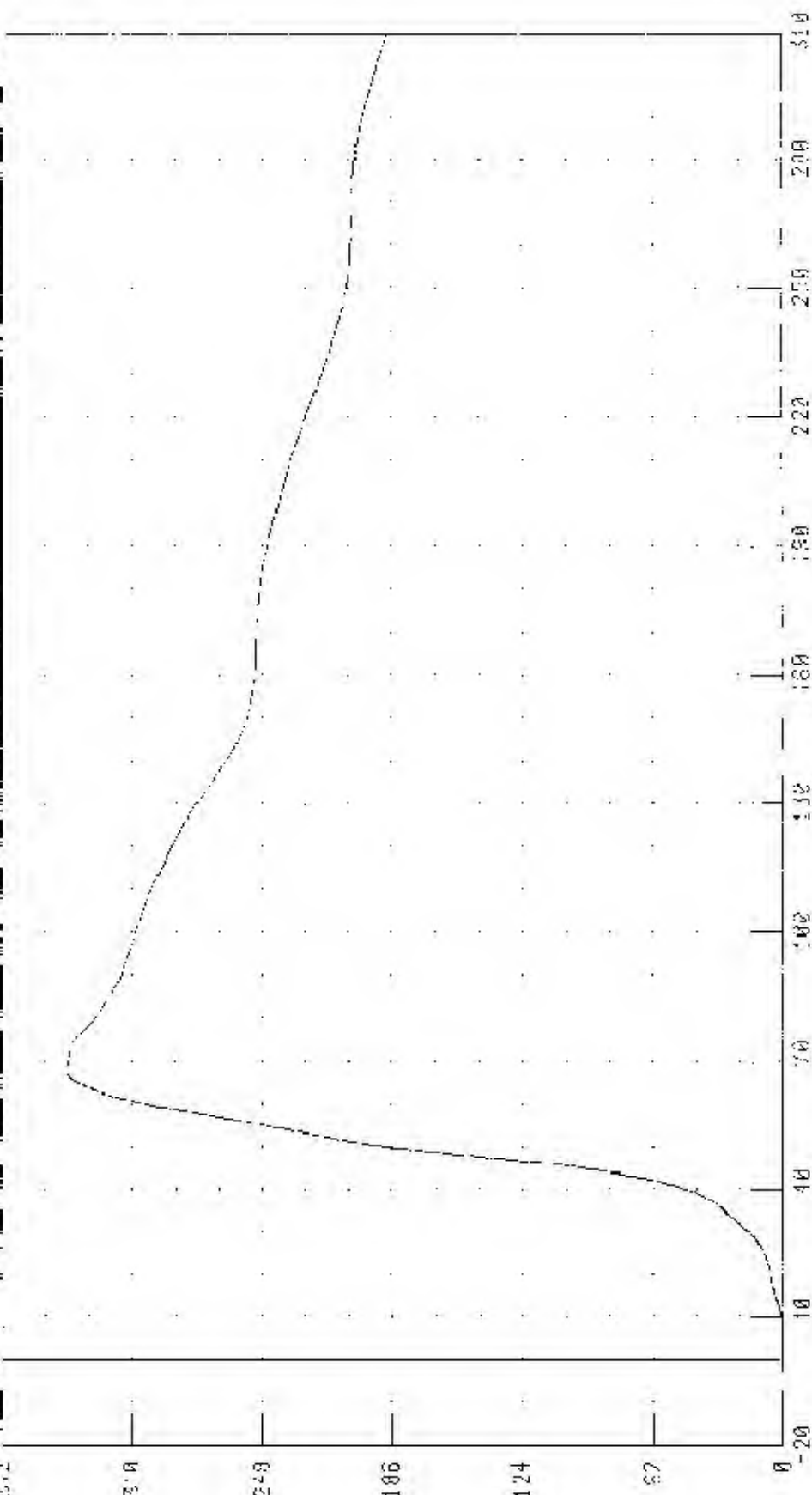
55008 K04 9M PLURFF SILE IMPACT MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF ZONE 2TW 22M

LEFT REAR PASSENGER PELVIC Y-AXIS VELOCITY

TEST NUMBER 032430

PHYS 214 LEFT SIDE IMPACT

TIME (MS)



VELOCITY (G) X 1000

TIME (MS)

CHANNEL FCYV4 FILTER CH. LOSS 180

PAGE 0470 34 07 K04 9M PLURFF SILE IMPACT MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF ZONE 2TW 22M

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

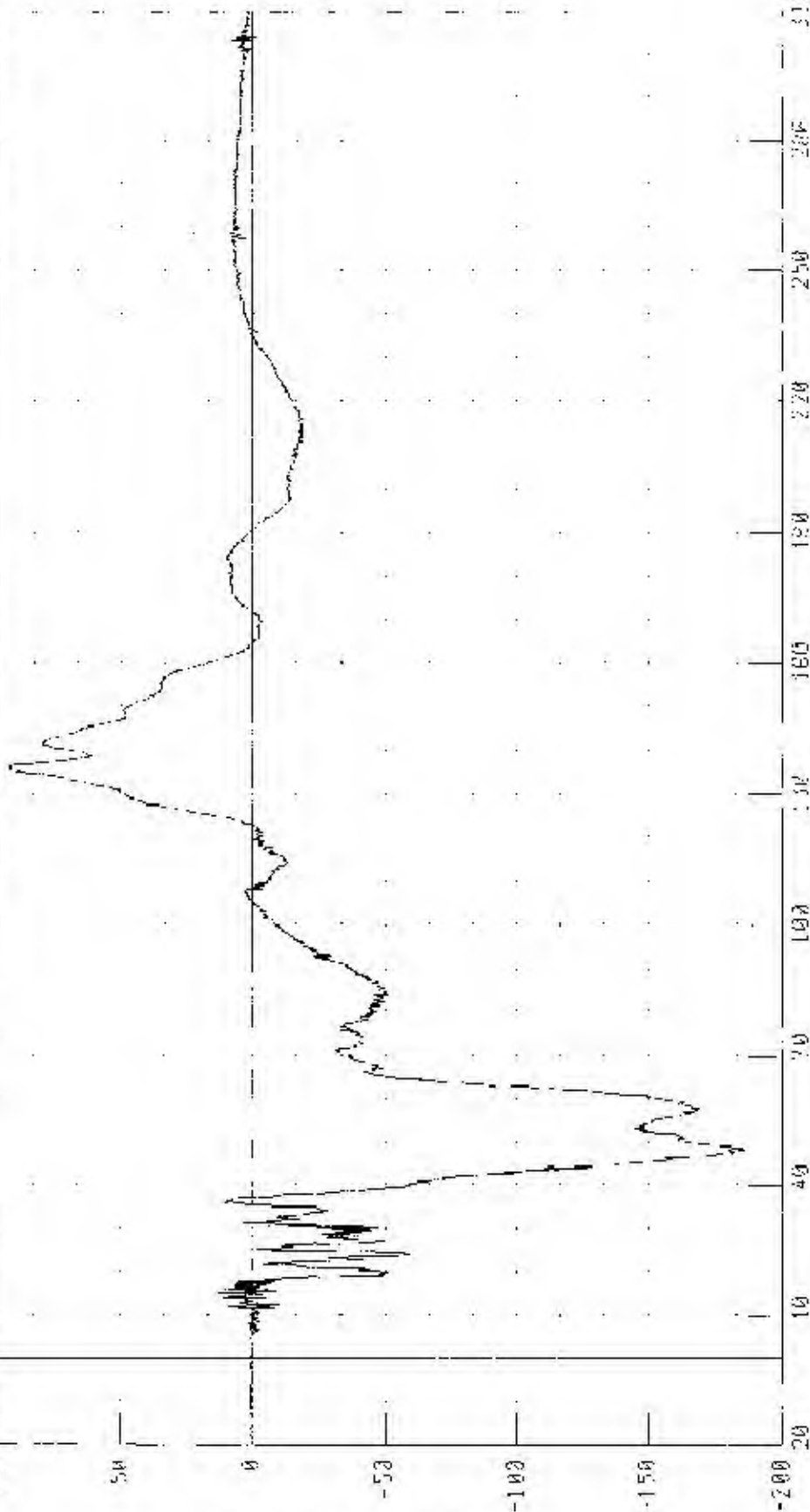
55.28 6-4 20 H-ORLE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2001 RUC 3051

DRIVER HEAD 6-3618 REINFORCEMENT OCCUPANT PROTECTION

TEST NUMBER: 030430

FMVSS 214 LEFT SIDE IMPACT

TRC INC



MAX DATA 3.27 0.9 215.42 MS, 18.56 G. 0.46 0.03 MS

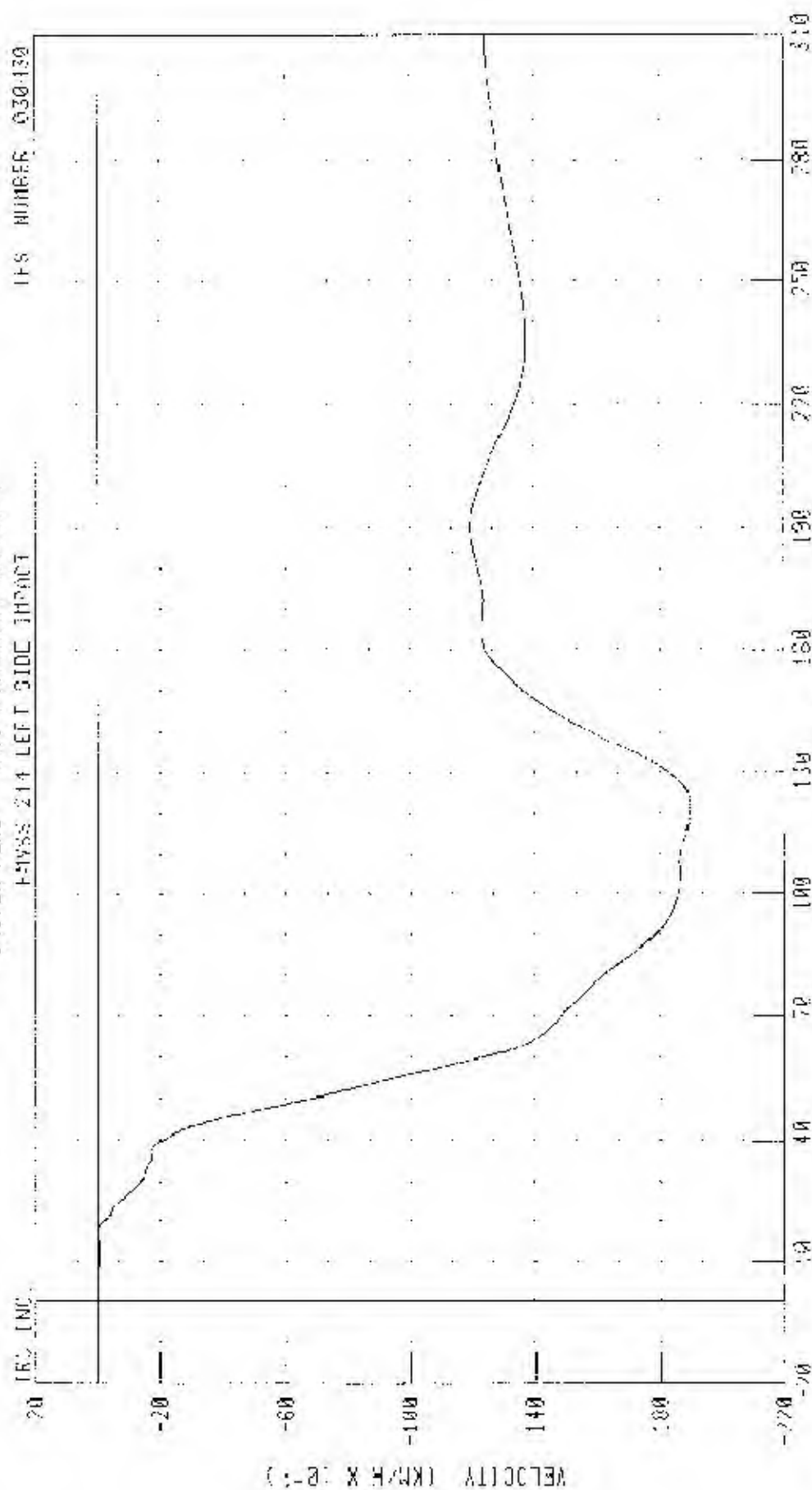
CHANNEL HEADER 111111 CH CLASS 1000

55/28 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD - 4X15 REBOUND VELOCITY

HYSS 214 LEFT SIDE IMPACT

IFS NUMBER 030430



TYPE INSY

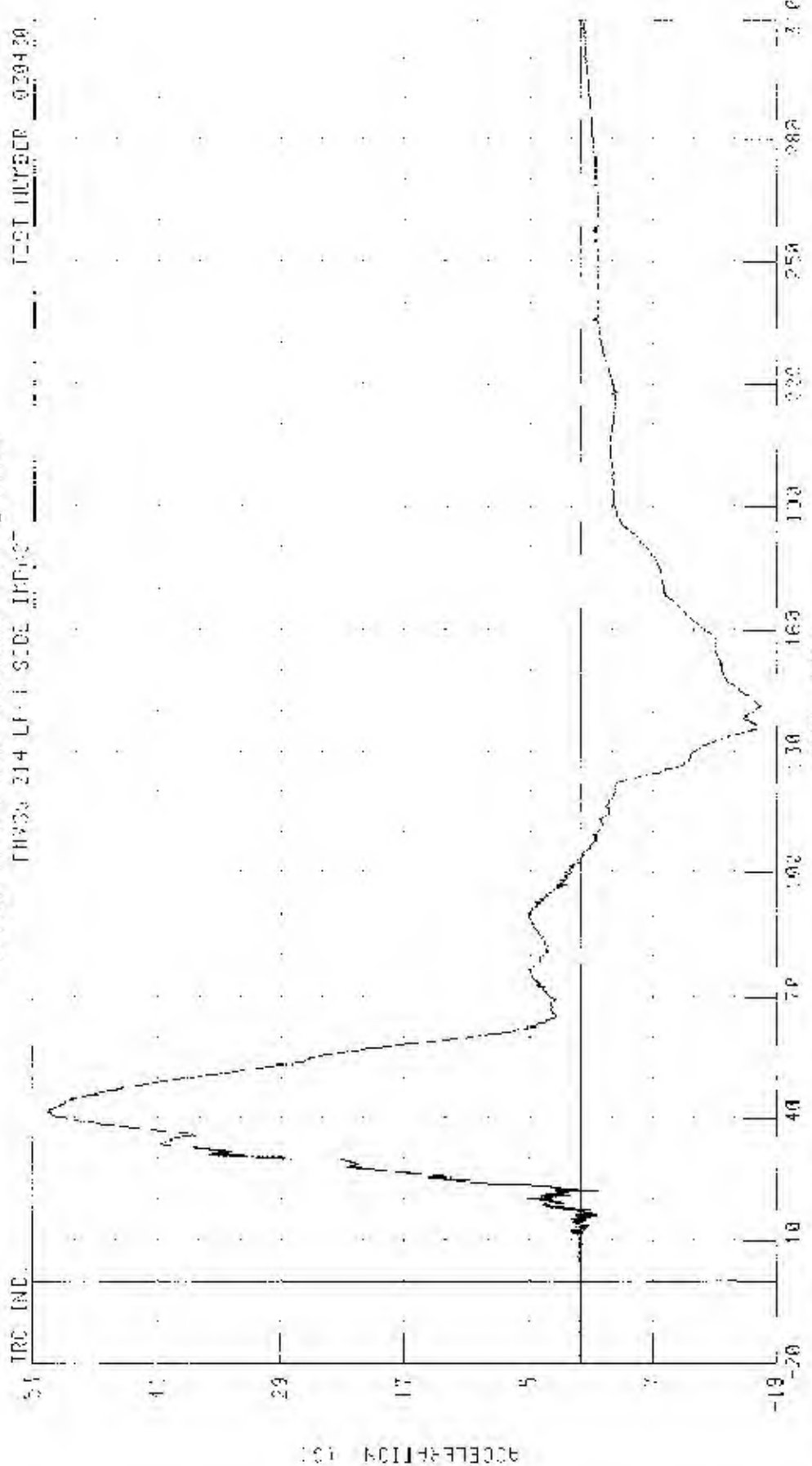
REF DATA 0 82 414 0 17 04 MS 19 10 40 41 N 122 80 NS

CHUNK# HELIXVI -ILIER CL CLASS 100

55-28 4TH 90 DEGREE SIDE 17-901 (MOVING BEFORWARD) 222150Z INTL 17-01 07 0043 BFW 2000

DRIVER FOCJ Y-AXIS REDUNDANT ACCELERATION

THRU 314 LEFT SIDE IMPACT TEST NUMBER 030430



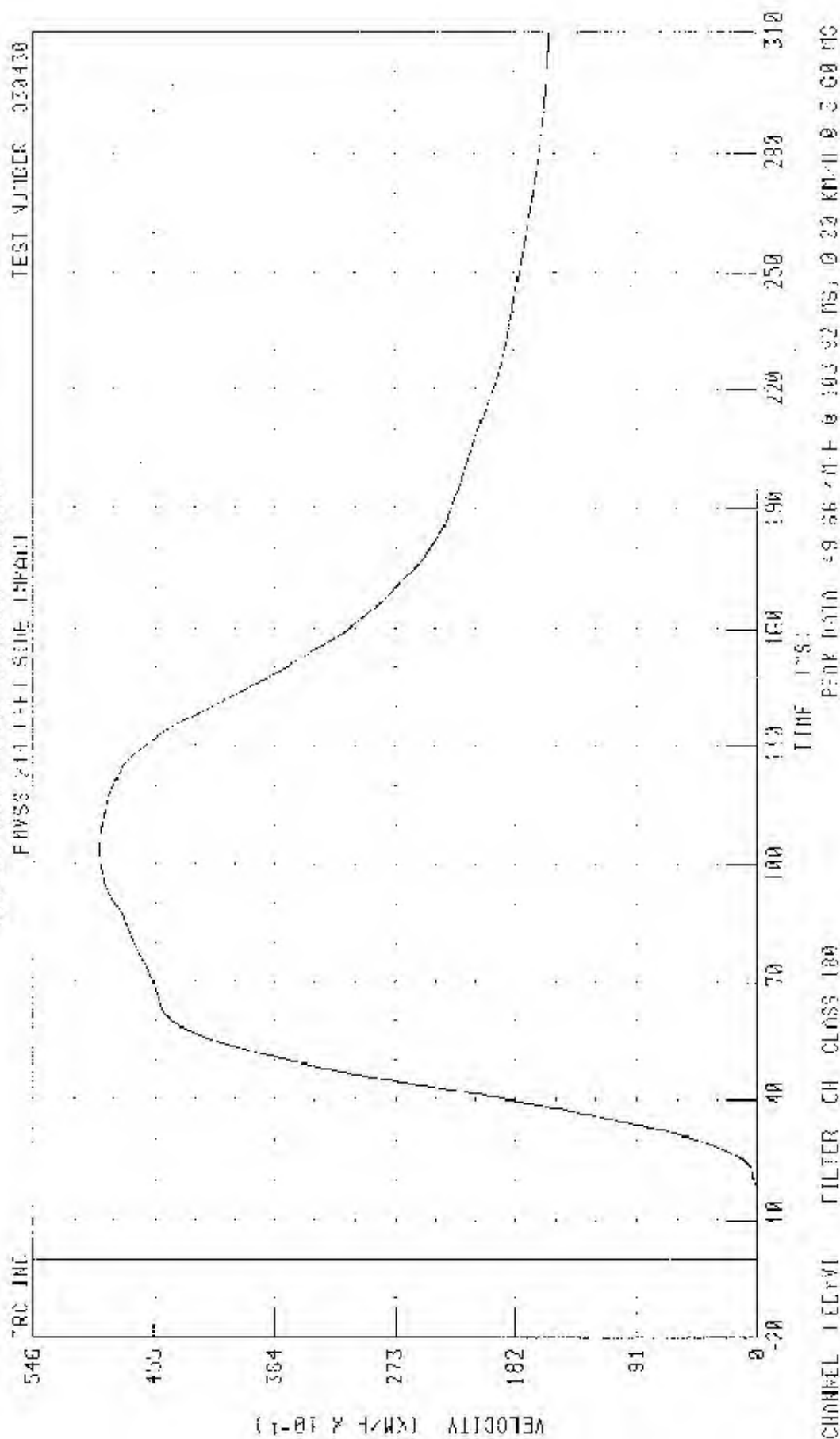
GRAPH: ACCY31 FILTER: 20 CLASS: 1900

TIME 1452

0748 1014 3 41 0 0 4' 50 115 17 45 2 0 141 70 100

55/26 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

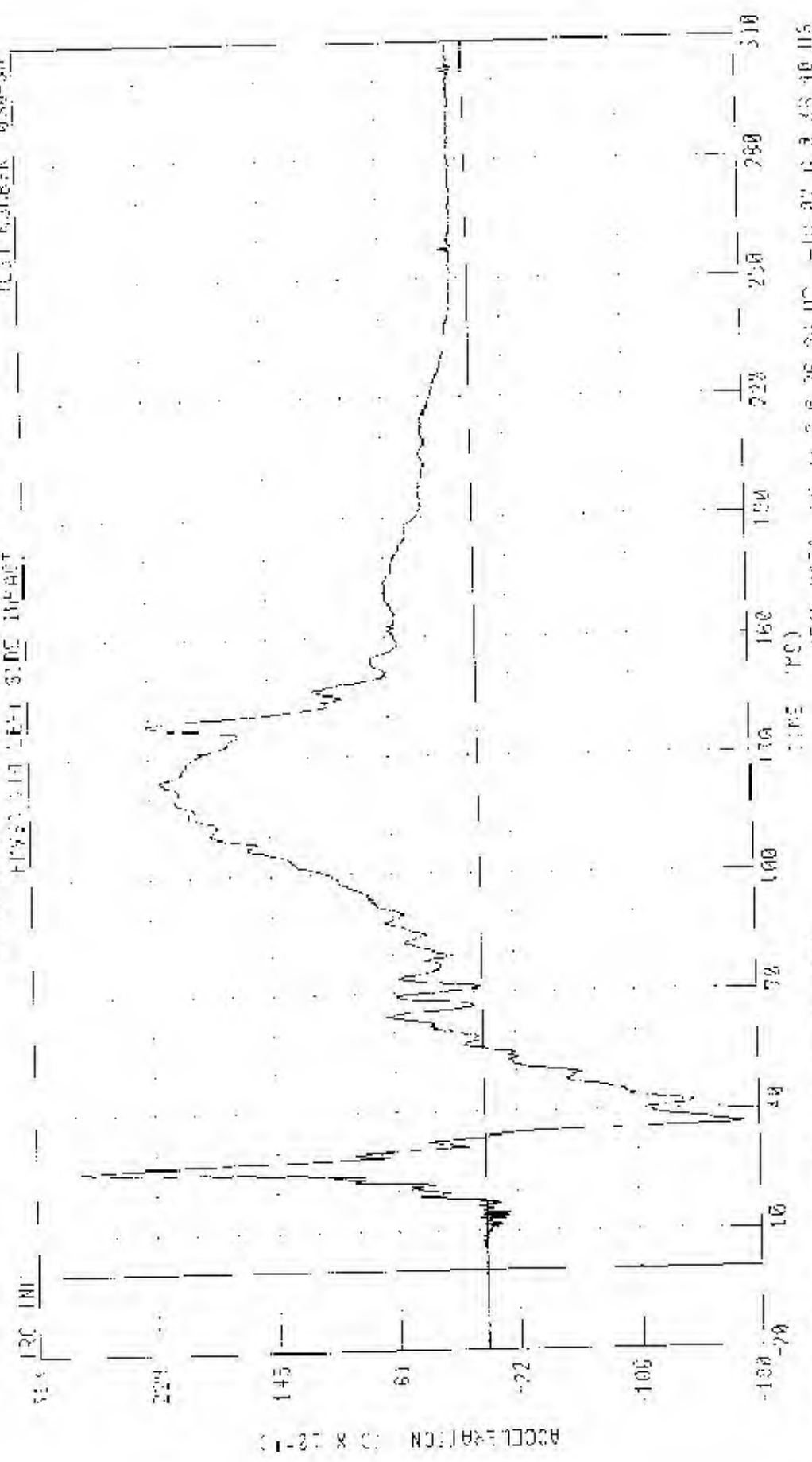
DRIVER HEAD Y-AXIS REDUNDANT VELOCITY



35/28 MPH 90 DEGREE SIDE IMPACT (MOVING DETONATOR IMPACT) INTO LEFT SIDE OF 2023 BMW 325I

RIVER HILL / 4X4 REDUCED ACCELERATION

PLATE 313 LEFT SIDE IMPACT TOTAL ENERGY 0.50458



PEAK DATA 28 70 3 26 24 102 -10 37 0 3 23 40 115

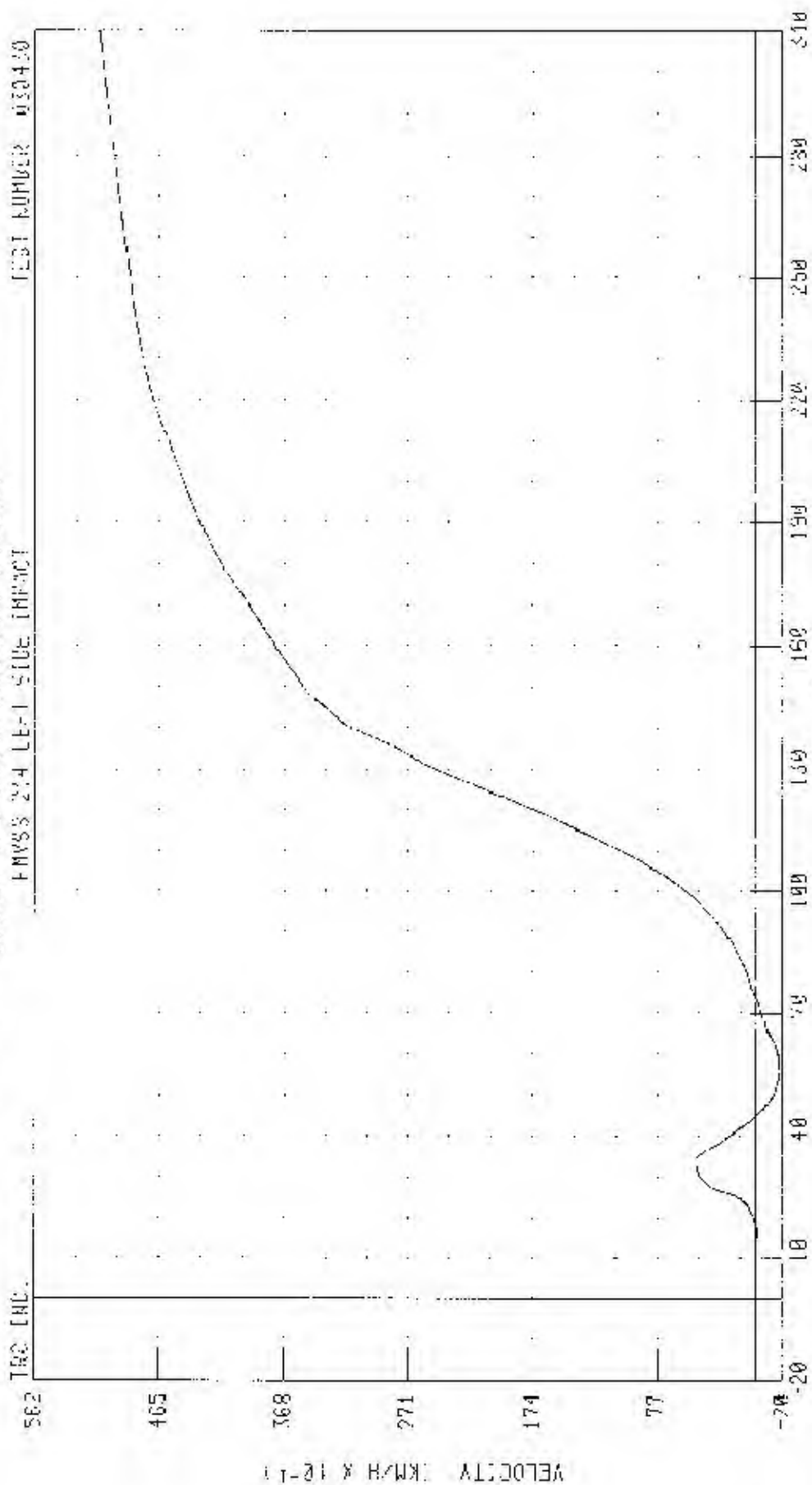
CHANNEL FILTER CALIBR UP CLASS 1000

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE CARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER HEAD Z-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

PEAK DATA: 51 11 KPH 40 310 MS: -1.32 KPH 0 56 08 MS

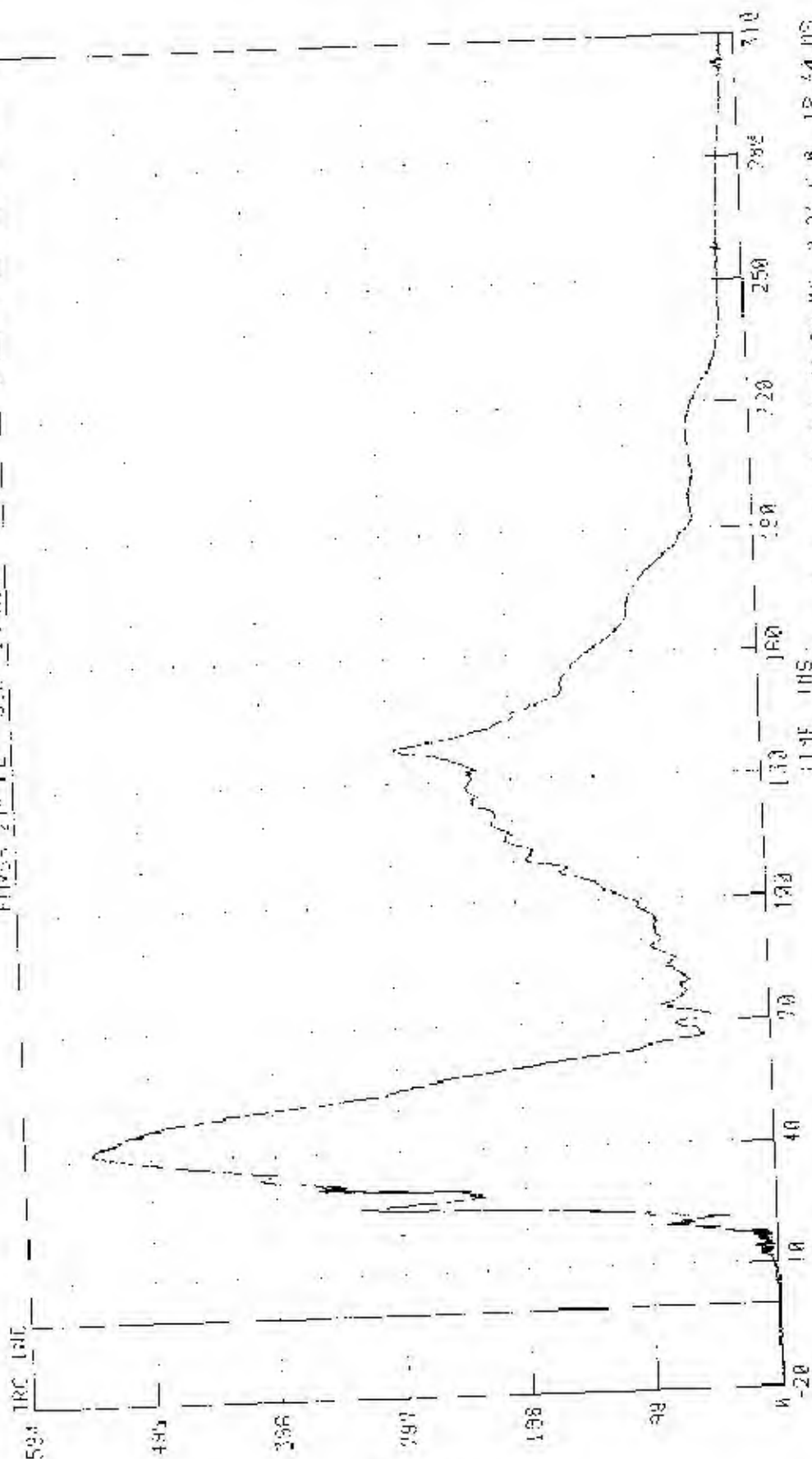
CHANNEL: HEADZV1 FILTER: CR. CROSS 130

55/28 3000 30 DEGREE SIDE IMPACT 1000/1000 DEGRADABLE RAMP 3000 1000 2003 3000 3000

CR10TH HEAD RESULTANT VELOCITY ACCELERATION

TEST NUMBER 030430

FILE 211111 511- 11-001



PERF DATA 54 00 00 41 20 MS, 0 00 00 18 40 MS

CHANNEL: 1000 10113 04 CLASS 1000

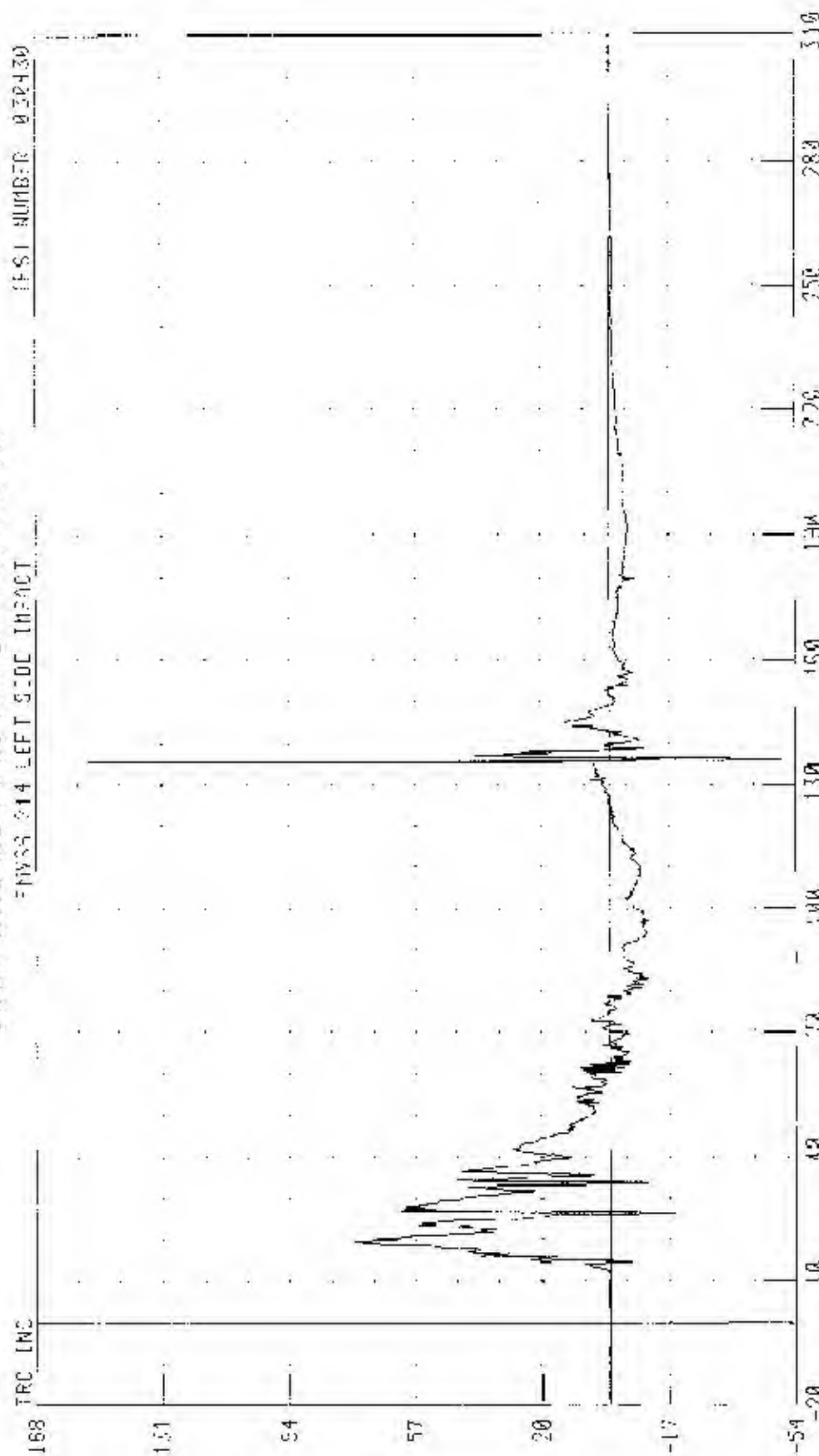
030430

55.28 KPH 90 DEGREE SIDE IMPACT (MOVING OFFENAB-F BARBER) INTO LEFT SIDE OF 2203 BFW 5251

DRIVER UPPER RED Y-AXIS REDUNDANT OCCUPANT POSITION

TEST NUMBER 030430

INVEST 014 LEFT SIDE IMPACT



ACCELERATION (G)

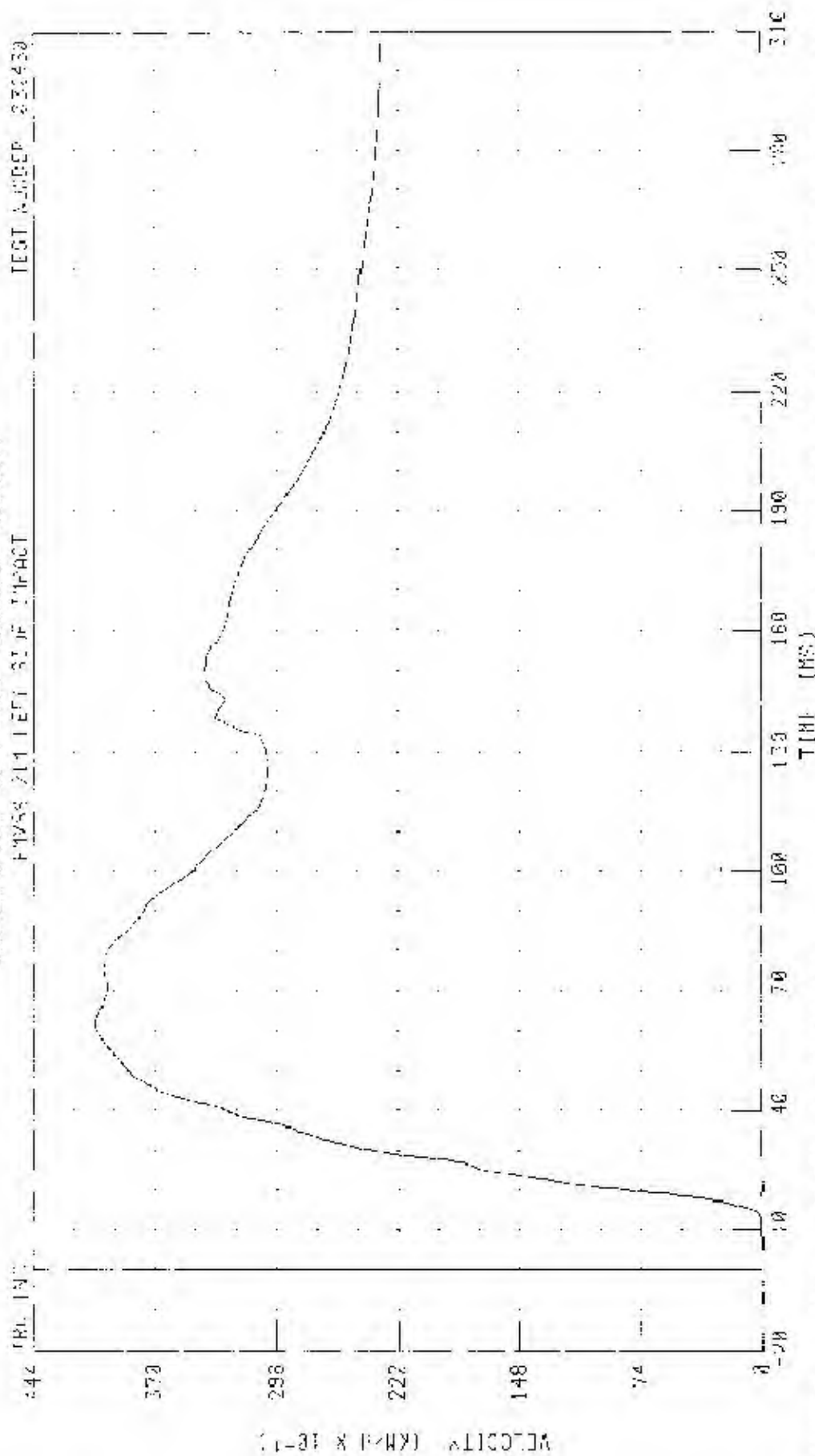
TIME (MS)

CLIFFORD LUTHER FILTER CUT CLASS 1300

PEAK DATE 152 01 0 0 1 35 35 MS, -19 54 G @ 132 04 MS

25428 RPM 50 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 BMW 325I

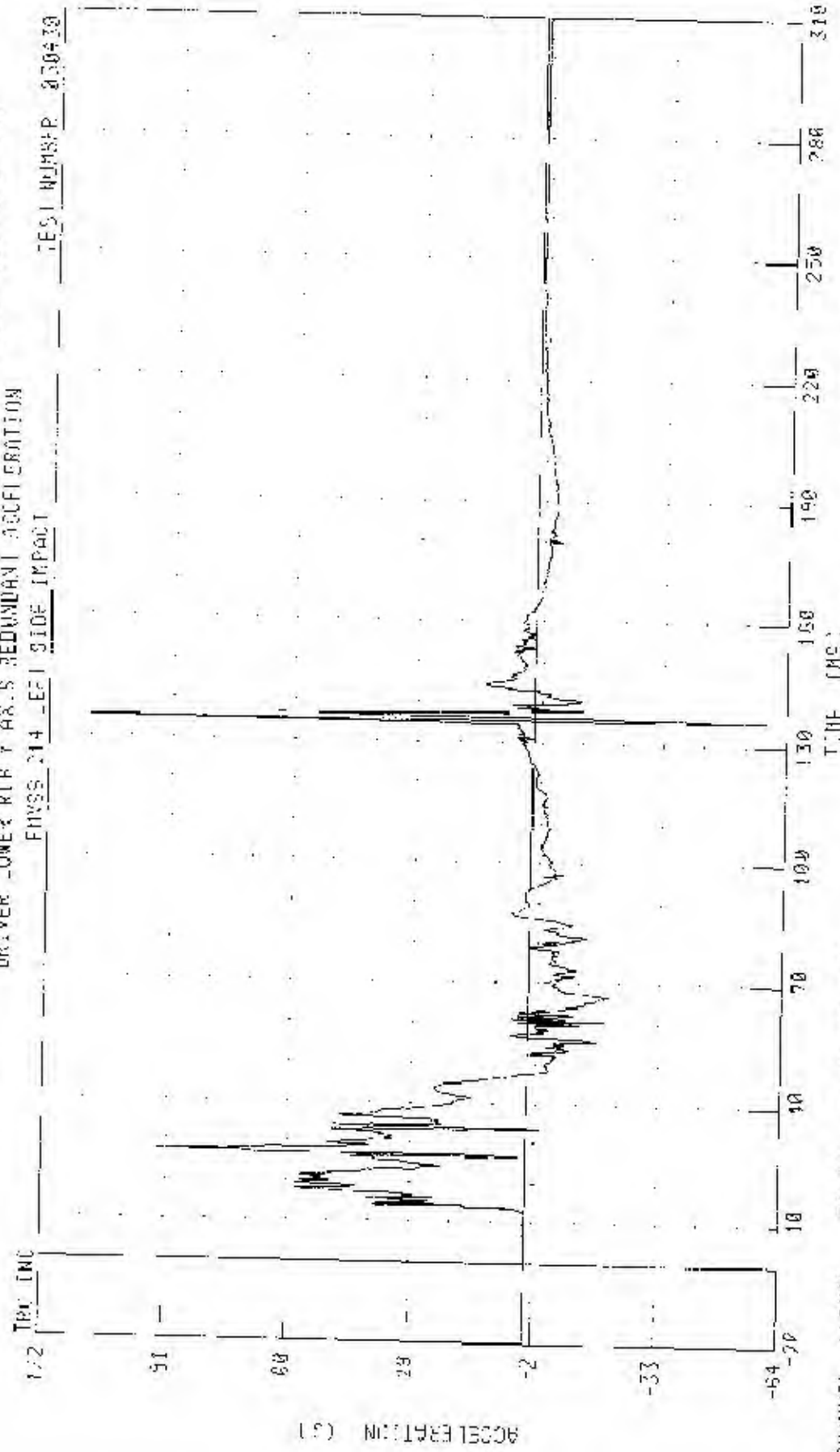
DRIVES OVER RIB Y AXIS REDUNDANT VELOCITY



CHANNEL CORYVI FILTER ON CLASS 100

PEAK 149 40 51 4M 1 2 62 16 15, 0 00 RPM - 0 2 24 MS

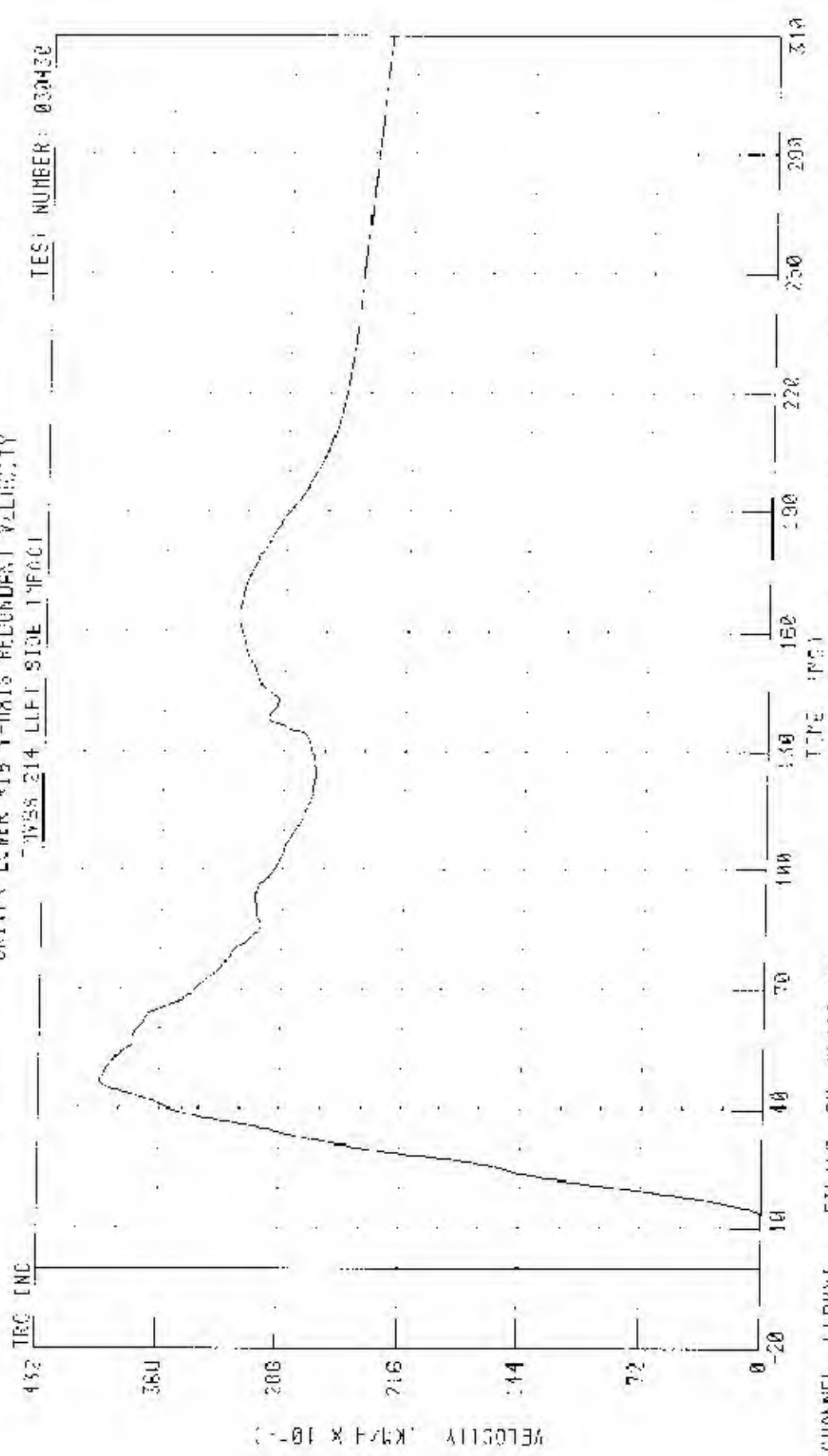
55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) 1/10 LEFT SIDE OF 2003 PHV (25)
 DRIVER LOWER RIB Y AXIS REDUNDANT ACCELERATION



CHANNEL LLR701 FILTER CH. CLASS 1000
 PEAK DATA 112.10 C 8 135.56 MS -50.85 G 135.84 MS

TEST NUMBER 030430

55/26 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 20MS EHV 325J
 DRIVER LOWER RIB V-AXIS BELT/DCA1 VELOCITY

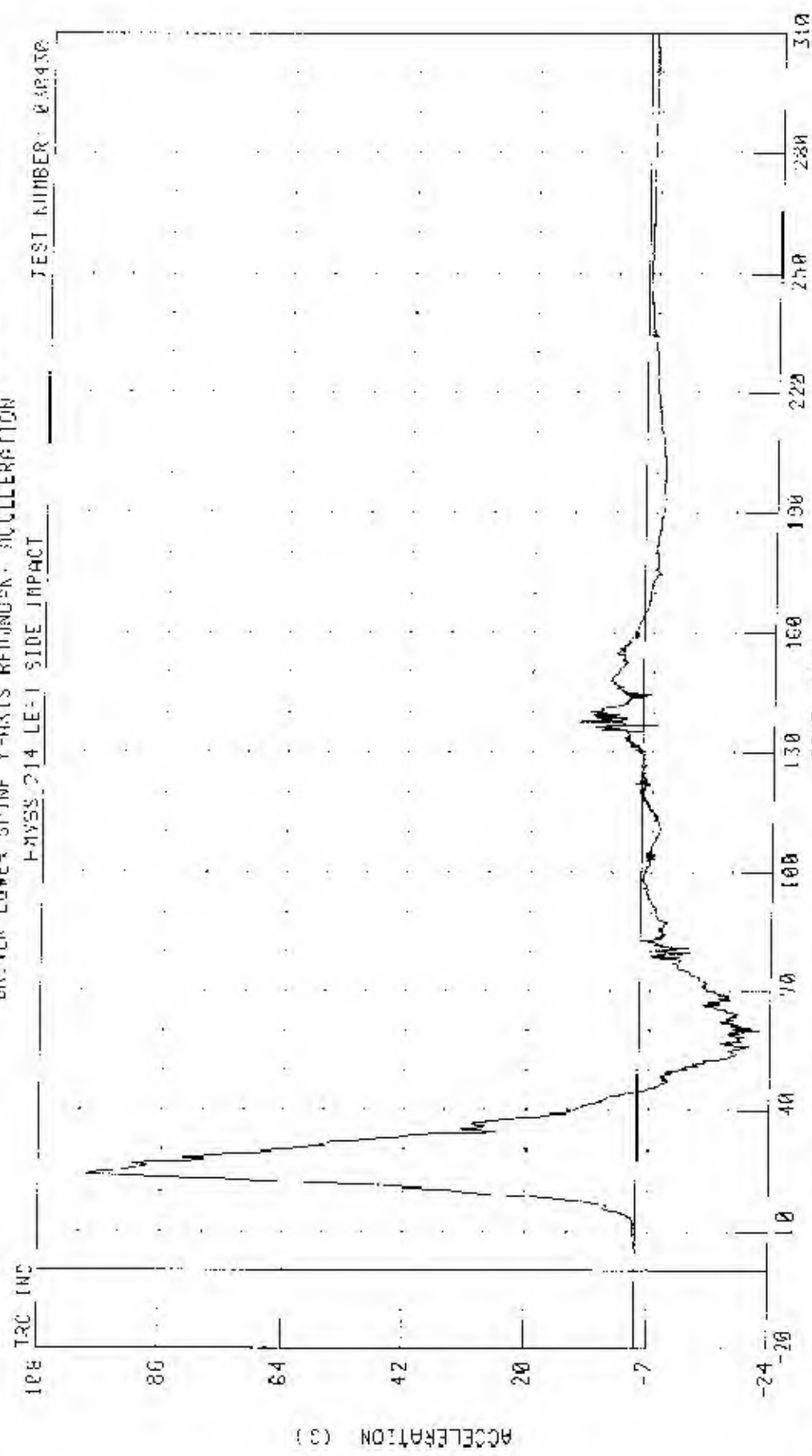


CHANNEL: L1R0V1 FILTER: CH CLASS 139

PEAK DATA 39.55 KM/H @ 43.14 MS, A 300 KPH @ 300 MS

55/28 MPH 90 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2005 HW 3251

DRIVER LOWER SPINE Y-AXIS REINFORCEMENT ACCELERATION



TEST NUMBER: 030430

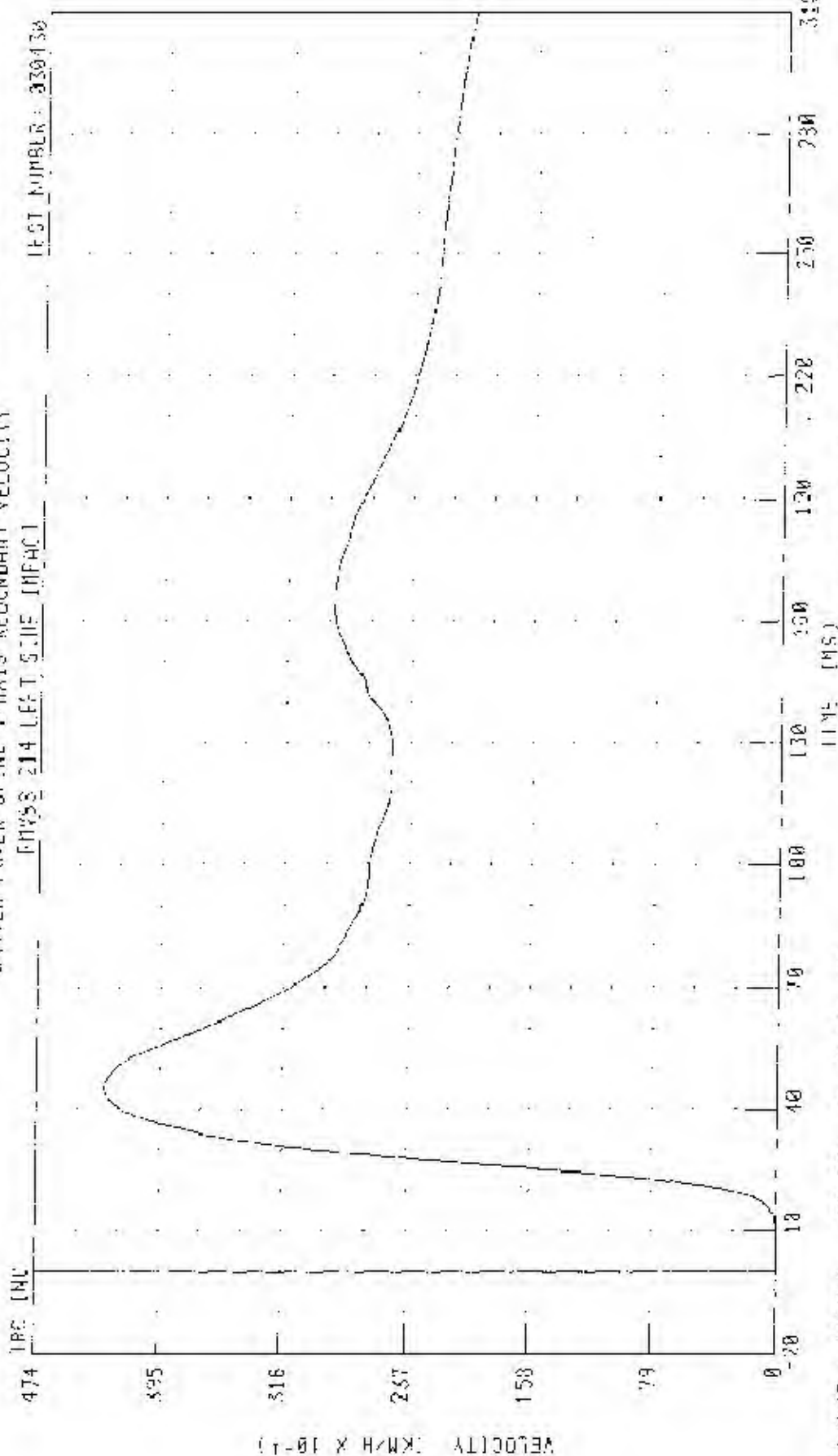
CHANNEL: T12VRI FILTER: CH GLOSS 1000

TIME (MS)

PEAK DATA: 89.28 30.74.24 MS; -22.01 0.00 00 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i
 DRIVER LOWER SPINE V-Axis REDUNDANT VELOCITY

TEST NUMBER: 330430



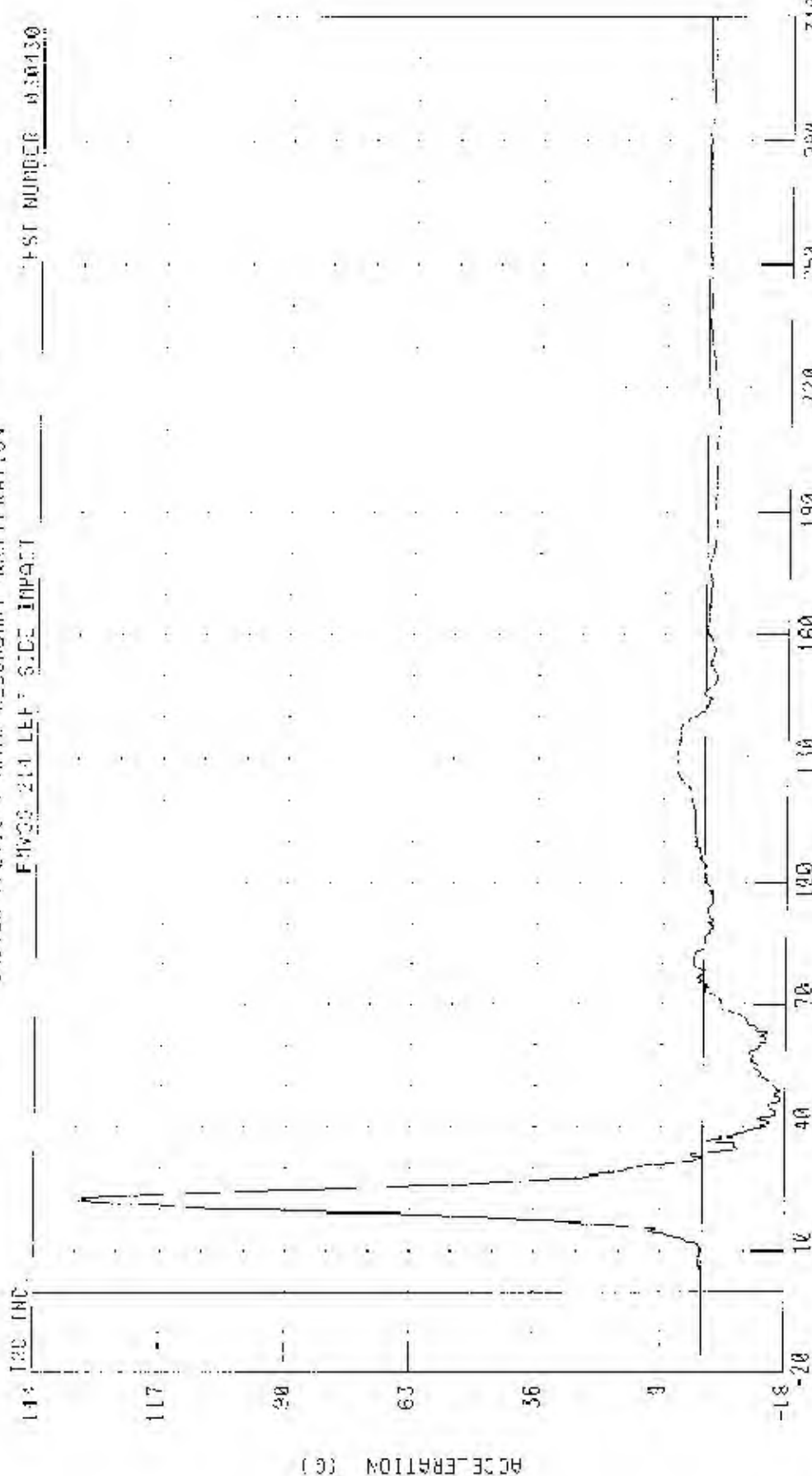
CHANNEL: 112VVI FILTER: CH CLASS: 100

PEAK DATE: 13 12 2001 04 45 00 MS; 0 30 20 4 0 0 00 15

55/20 K-H 92 DEGREE S-LIP IMPACT (MOVING DEFORMABLE CARRIER: INTO LEFT SIDE OF 200S RHW 325;

DRIVER PLVVIS 2 AXIS RESONANT ACCELERATION

120 INC. FMVCS 214 LEFT SIDE IMPACT TEST NUMBER 030430



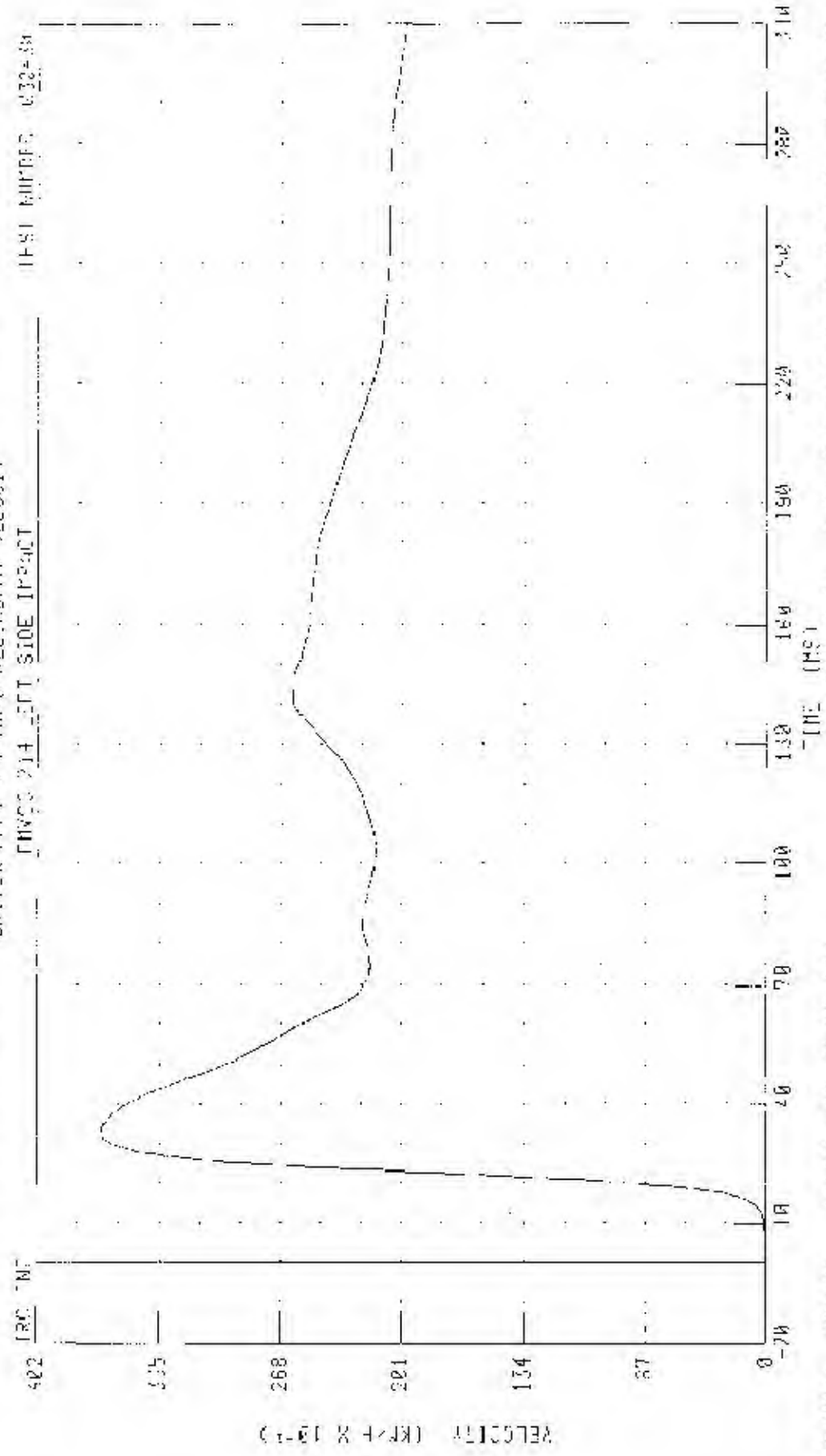
CHANNEL PEVYRI FILTER: CH CLOS 1000

TIME (MS)

*LAK DATA 134 12 3 5 27 40 35; -15 73 5 8 16 12 18

55423 KPH 90 DEGREE SIDE IMPACT INVOLVING DEFENSIBLE BARRIER PHOTO LEFT SIDE OF 2003 EFW 3250

DRIVER PEVY'S Y-AXIS RECOILMENT VELOCITY



CHANNEL PEVYV1 FILTER: CII CLASS: 130

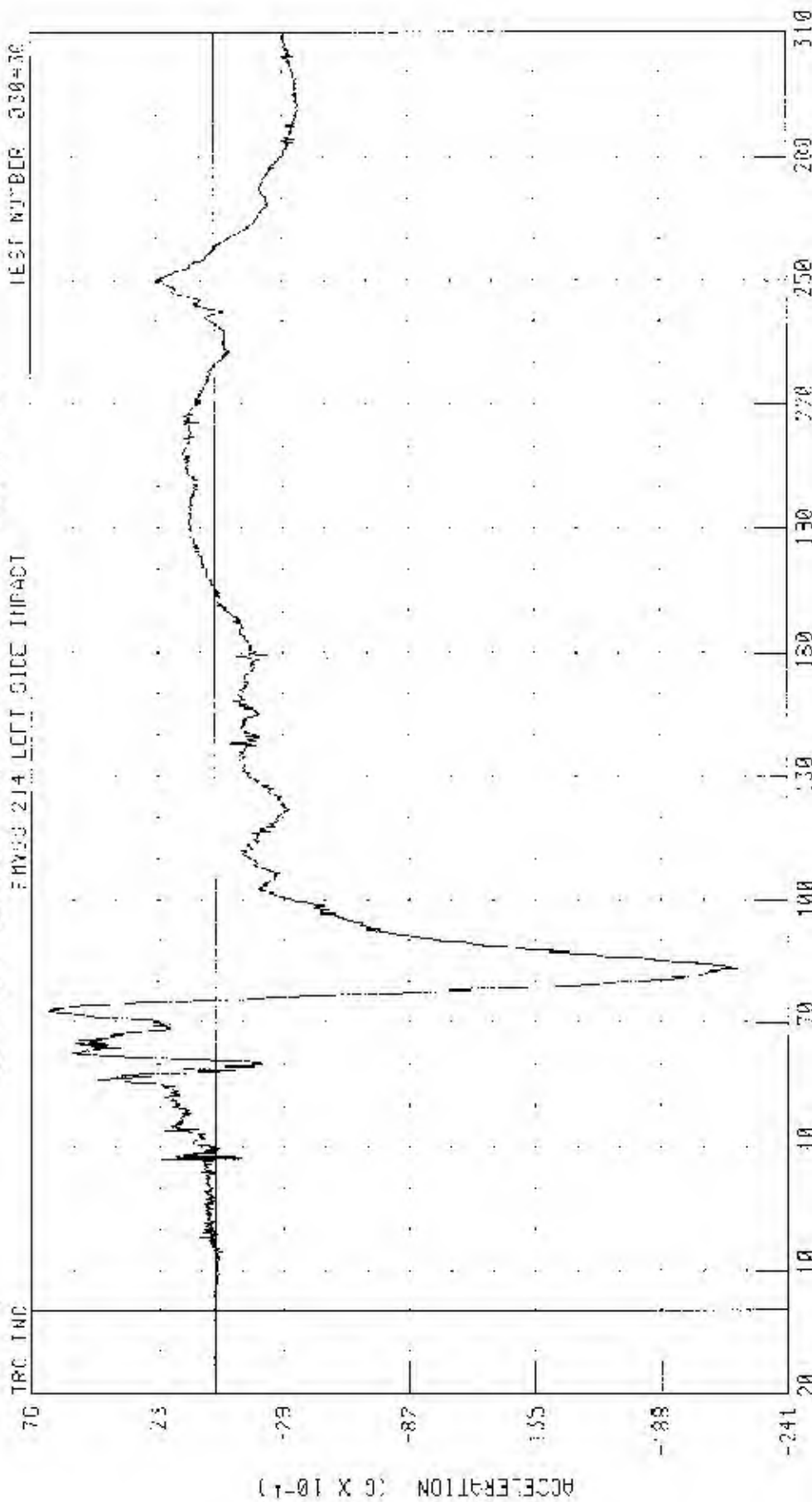
PEAK TIME 35.76 MS, 33.52 RS, 35.30 EFW 3250

35/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) IN DUFF SIDE OF 2003 BMW 325i

LEFT REAR PASSENGER HATCH X-AXIS REDUNDANT ACCELERATION

PHYS 214 LEFT SIDE IMPACT

TEST NUMBER 330430



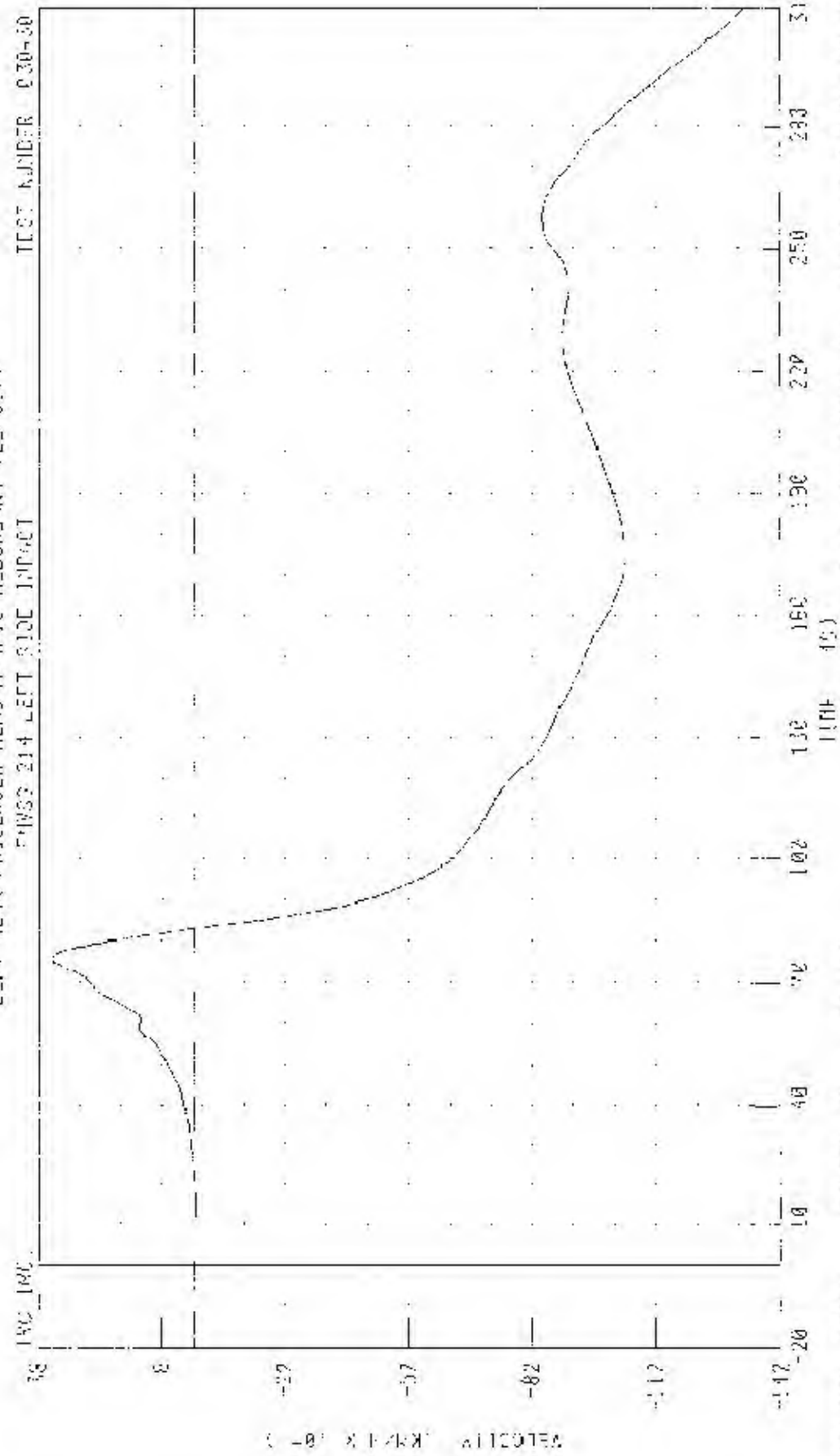
1176 (1%)

CHANNEL: HFOXR4 FILTER: CH CLASS: LOGG

PEAK DATA: 1.04 G @ 72.80 MS, -71.98 @ 253.52 MS

15-20 KPH 90 DEGREE SIDE IMPACT (MOVING COTRIPPLE GERRIER) INTO LEFT SIDE OF 2003 B/W 325J

LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT VELOCITY



CHANNEL FFDXV FILTER CH 0.035 130

PEAK VALUE: 3.19 KPH @ 25.50 MS, -13.16 KPH @ 314.00 MS

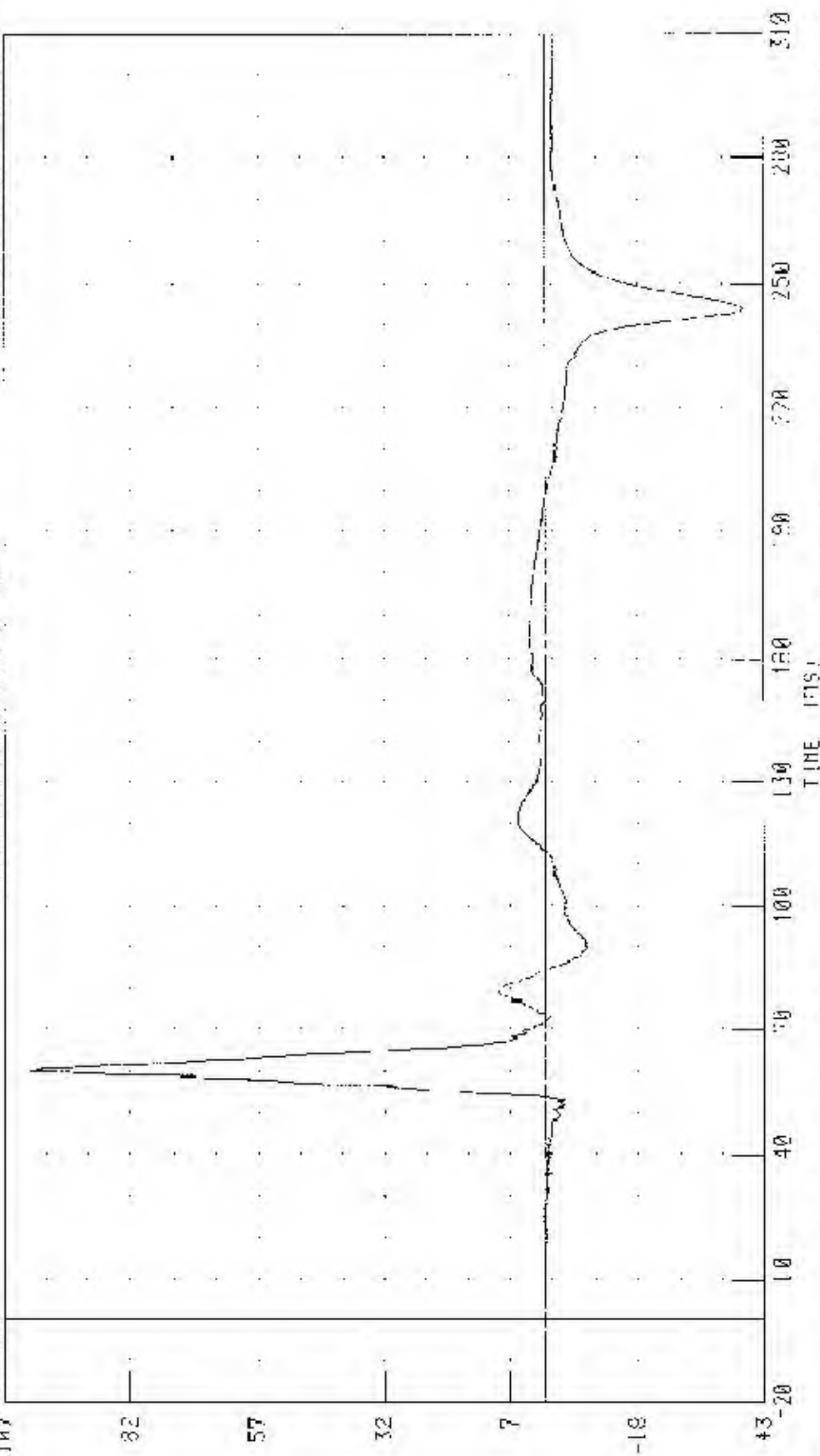
35/26 KPH 50 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

LEFT REAR PASSENGER HEAD Y AXIS REDUNDANT ACCELERATION

TRC INC

TRUSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

CHANNEL: FLDY44 FILTER: 011 CLASS: 1000

SPK DATA: 182 21 0 0 00 24 MS 39 20 0 0 243 58 18

ACCELERATION (G)

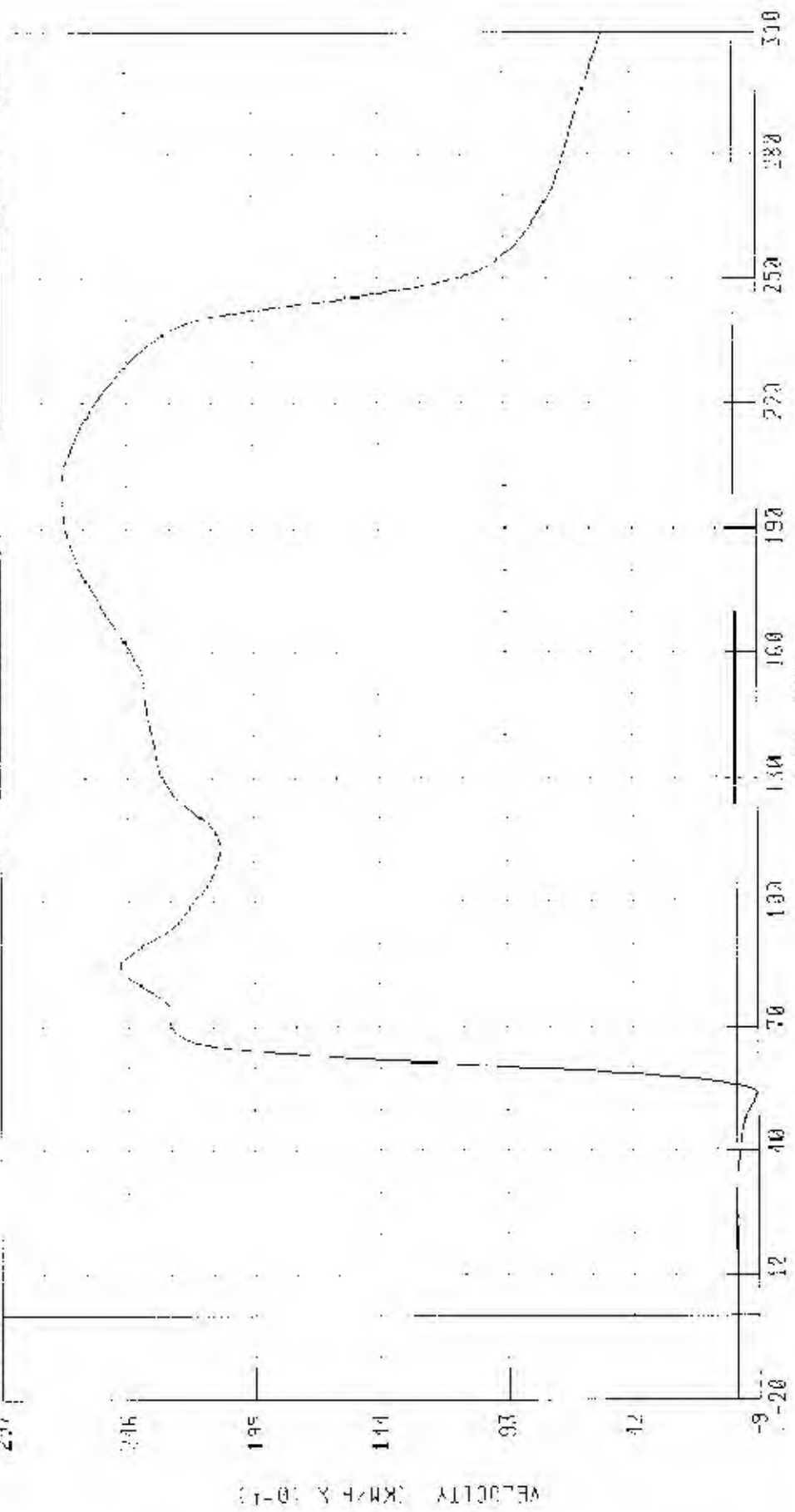
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFURNABLE BARREL) INTO LEFT SIDE IN 20MS IMP 3251

LEFT REAR PASSENGER HEAD X AXIS REDUNDANT VELOCITY

180 INC 237 236 195 144 93 42 -9 -20

CHASSIS 214 LEFT SIDE IMPACT

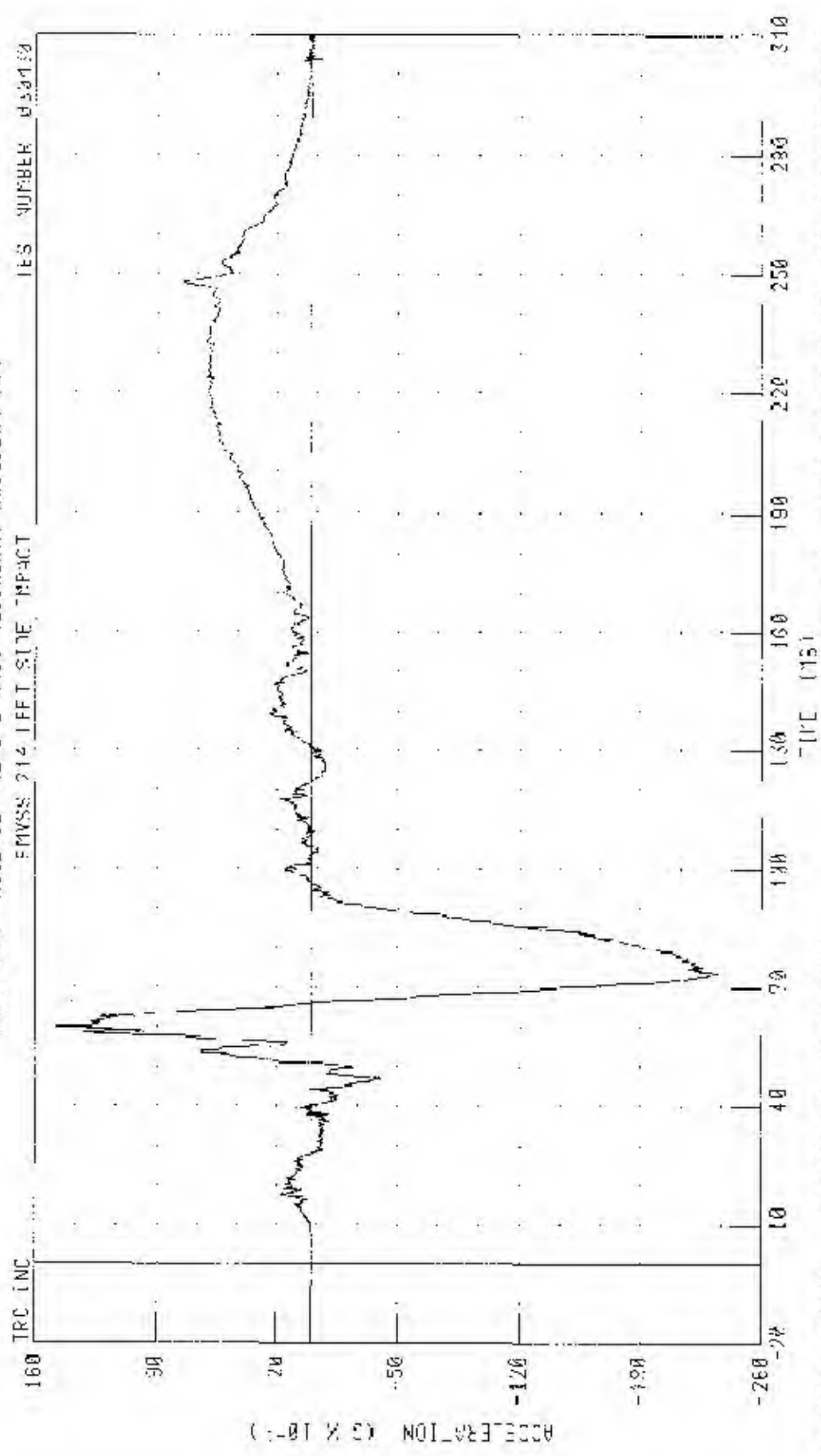
EST KJ/MSR 232150



LINE IMP

CHANNEL 100V00 P1 100-00 CLASS 100 PEARL 0000 21 21 KPH-0 193 72 193 -0 85 KPH-0 55 85 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) (NIO LEFT SIDE OF 2003 BMW 325i)
 LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT ACCELERATION



FMVSS 214 LEFT SIDE IMPACT

IES NUMBER 0504150

CHANNEL 000224 FILTER CH. CLASS 0000

TIME (15) 11:55:00.59.92 MS; -23.45 0 0 15.00 MS

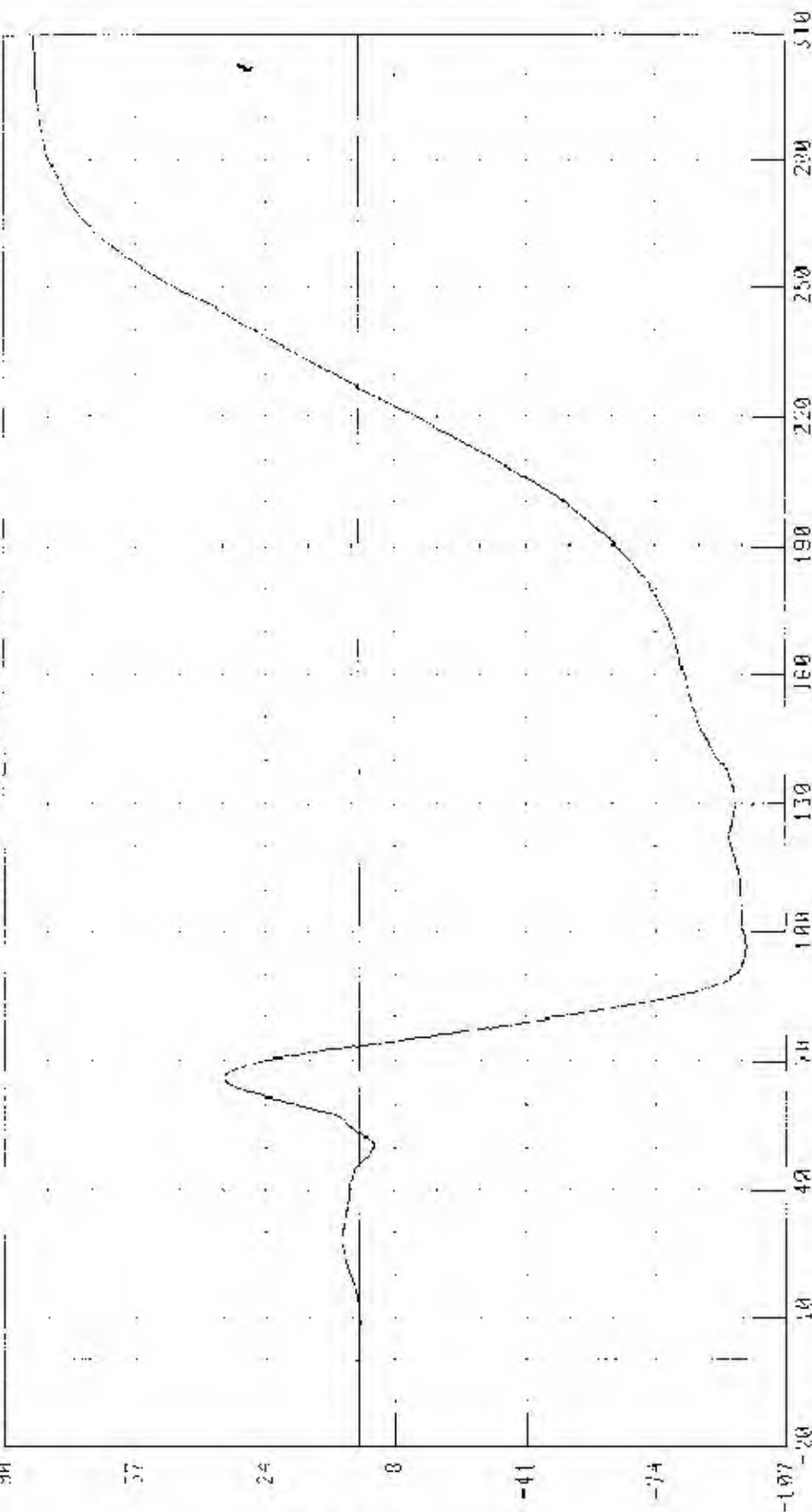
55/28 4PH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2000S BMW 525i

LEFT HEAD PASSENGER HEAD Z AXIS REDUNDANT VELOCITY

REC TIME

FMVS 214 LEFT SIDE IMPACT

TEST NUMBER 030430

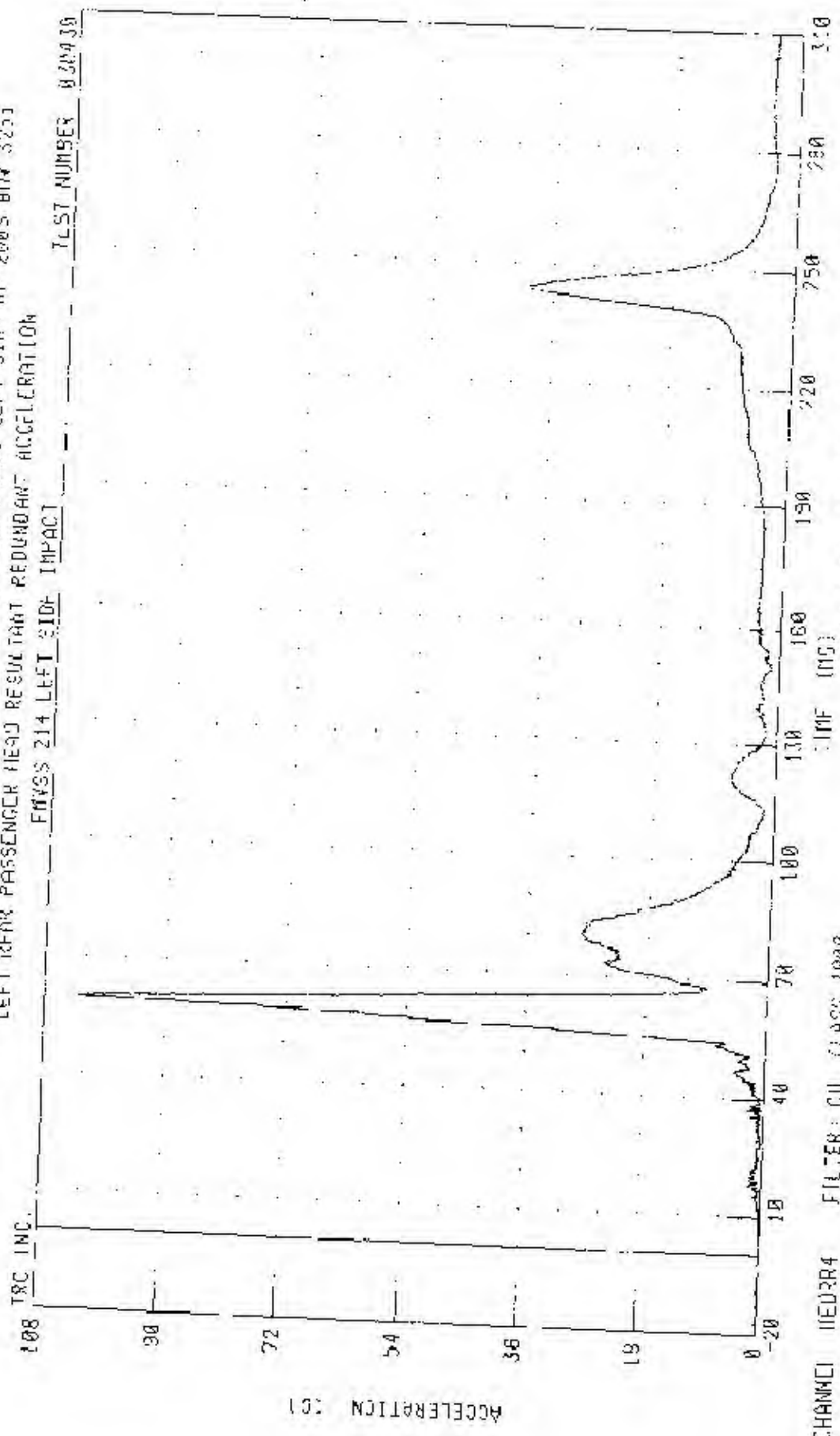


TIME (MS)

CHANNEL HEADZVJ FILTER CH. LOSS 30

PEAK DATA 8/24 KPH-H 0.00 MW 13, -0.80 KPH-S 0.00 72 MS

55-28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i
 LEFT REAR PASSENGER HEAD RESULTANT REDUNDANT ACCELERATION



CHANNEL 1IED3R4 FILTER: CII CLASS 1000

PLAK DATA 193.08 5.3 50 24 MS, 0 01 5 0 -16 56 MS

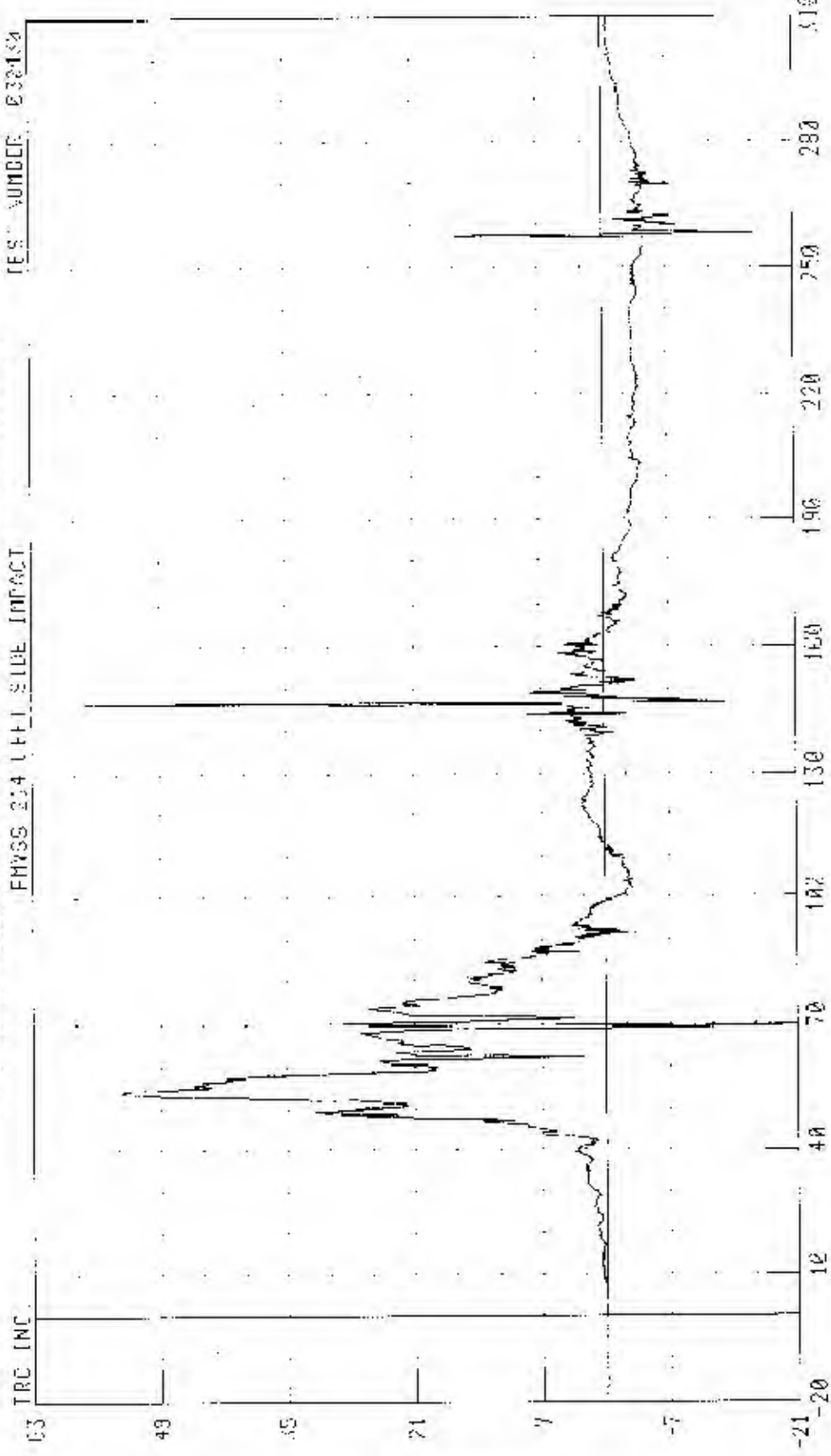
ACCELERATION (G)

55/28 MPH 60 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INIT LEFT SIDE OF 200 S HWY 325

LEFT REAR PASSENGER UPPER RIB V-12'S R-IMPACT ACCELERATION

TEST NUMBER: 032154

FMVSS 214 LEFT SIDE IMPACT



TIME (MS)

LINK DATA: 57.52 G @ 145.56 MS, -19.33 G @ 69.52 MS

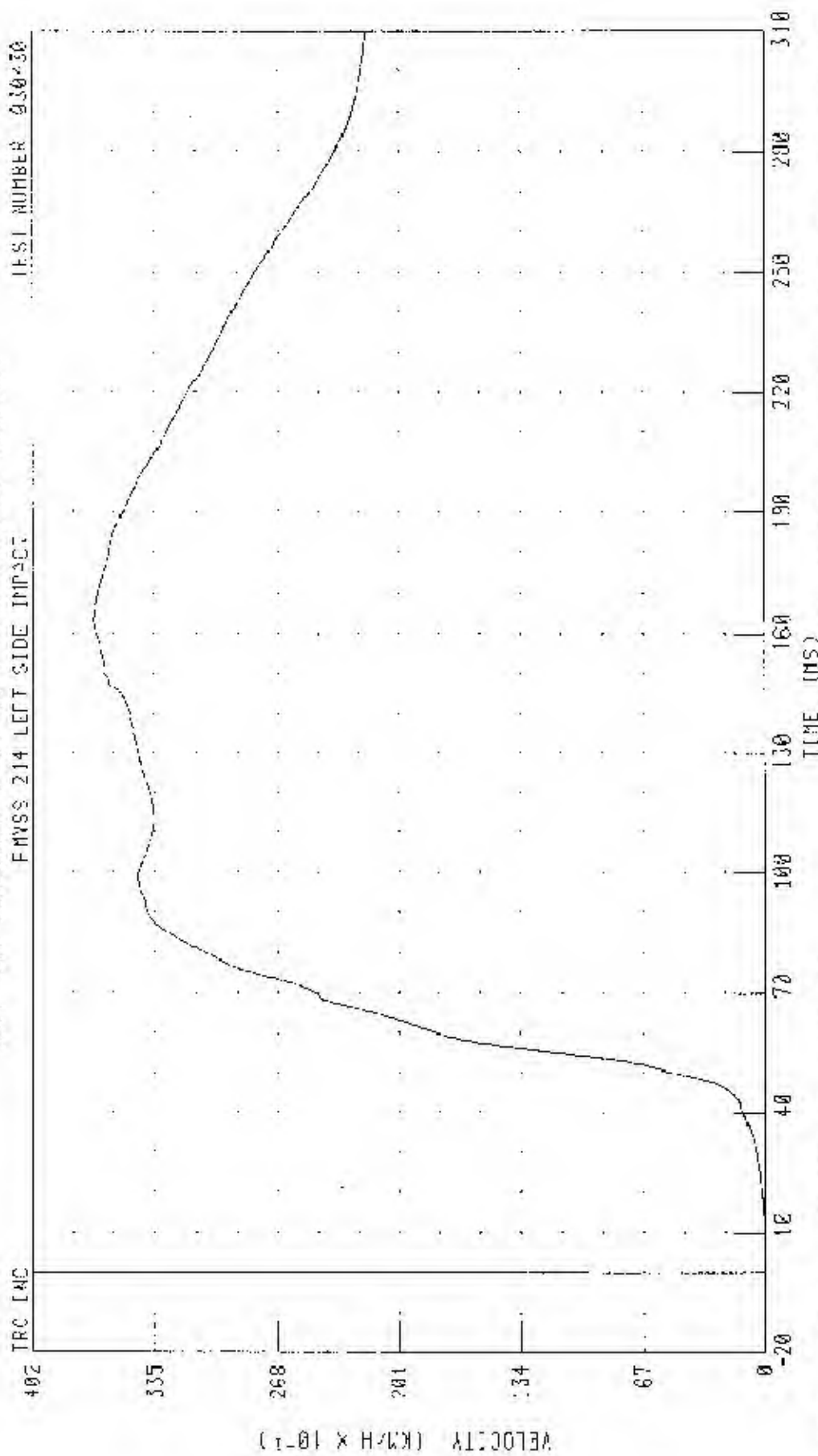
CHANNEL: 1 JRY114 FILTER: C1 CLASS: 1000

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2203 ERY 3251

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL: LUPYVJ FILTER: CH CLASS: 160

PEAK DATA: 35.85 KPH @ 105.04 MS, 3.20 KPH @ 20.00 MS

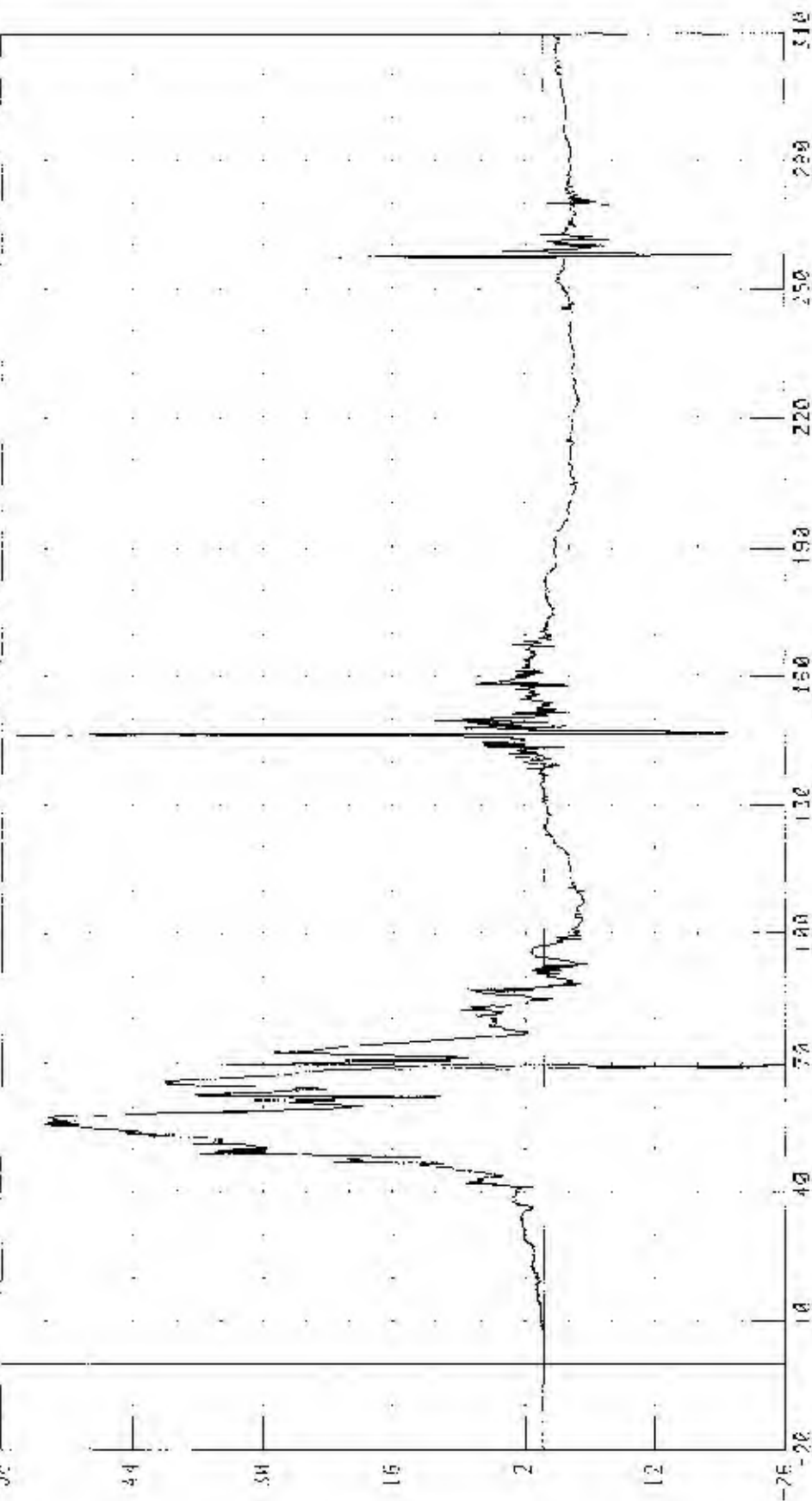
55-20 KPI 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 31W 3251

LEFT REAR PASSENGER LOWER R13 Y AXIS REDUCED ACCELERATION

TRC (M)

FMVSS 224 LEFT SIDE IMPACT

TEST NUMBER 030430



11.12

PEAK 3019 55 47 0 6 143 56 MS; -24 16 0 0 69 52 15

CHANNEL 114734 FILTER: CH CLASS 1000

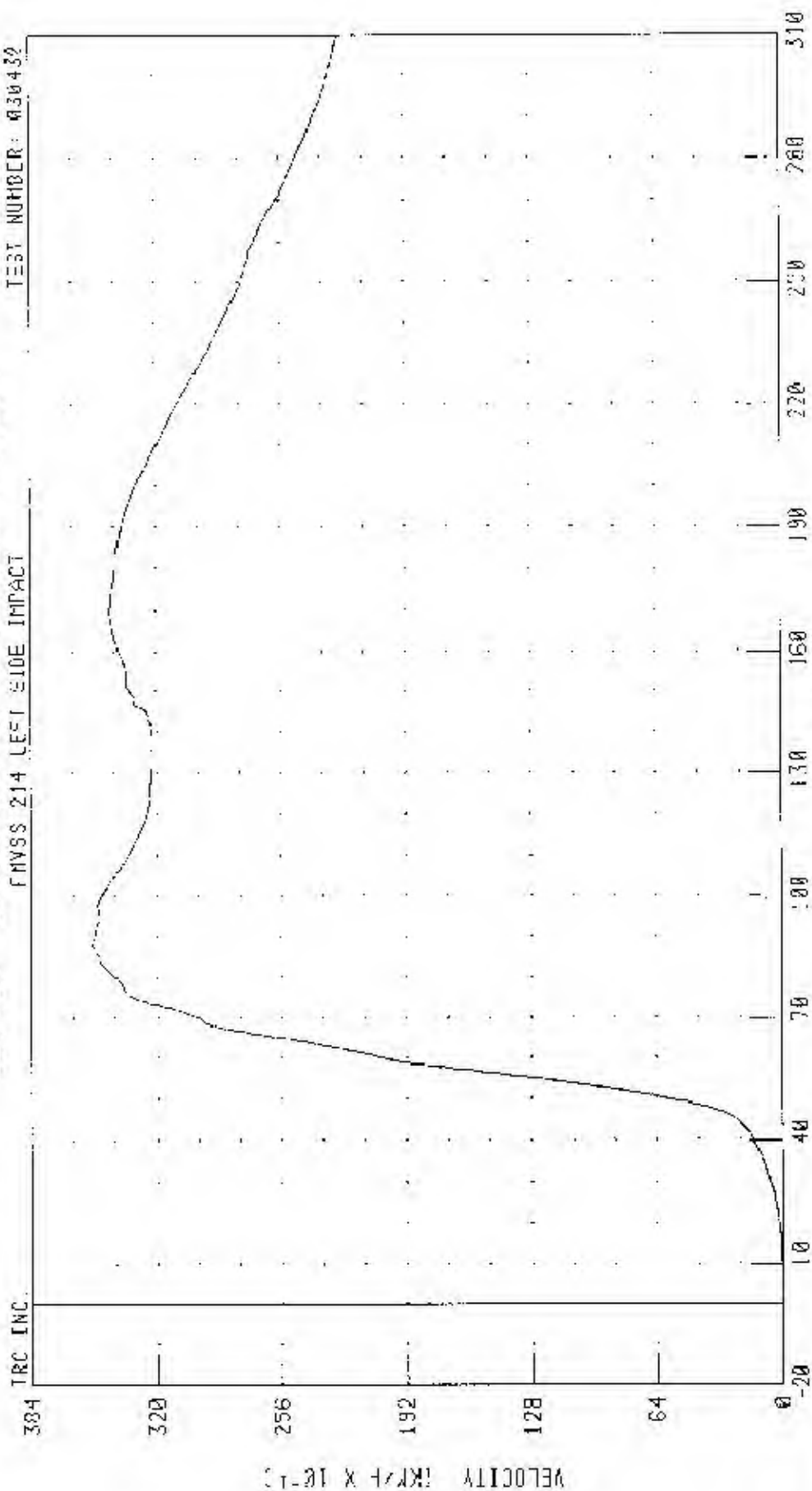
(5) 001108173000

55/28 KPH 400 DEGRFF SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 ENH 3251

LEFT REAR PASSENGER LOWER RIB Y-AXIS REBOUNDANT VELOCITY

TEST NUMBER: 030430

FNVS 214 LEFT SIDE IMPACT

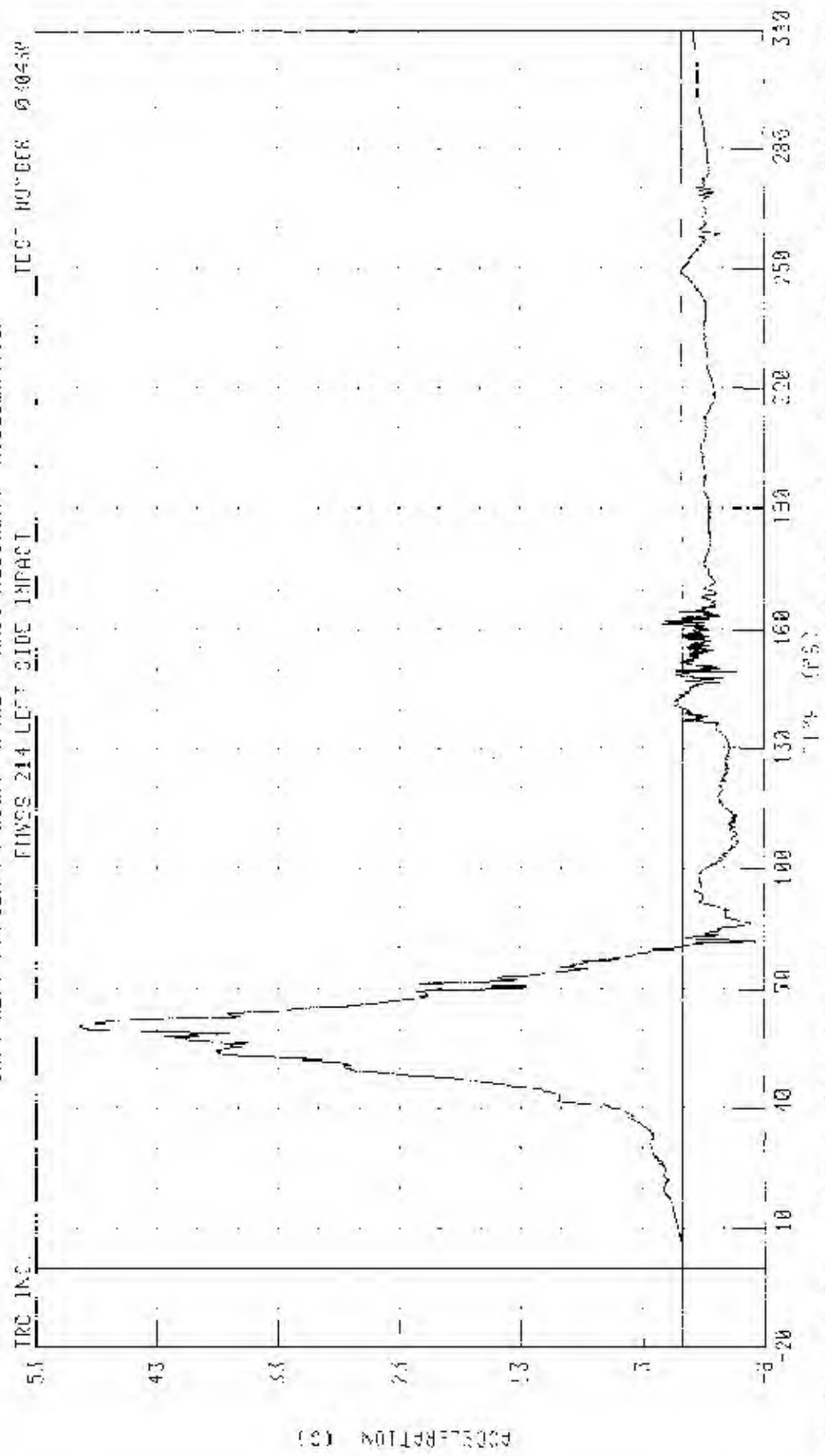


CHANNEL: 1LRVJ FILTER CH CLASS 180

PEAK DATA: 35.31 KPH 3.88 09 MS 0.00 KPH 0.00 75

00/20 MPH 00 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER: INTO LEFT SIDE OF 2003 B1W 3251

LEFT REAR PASSENGER LOWER SPINE 7-AXIS REDUCED-AMPLITUDE ACCELERATION



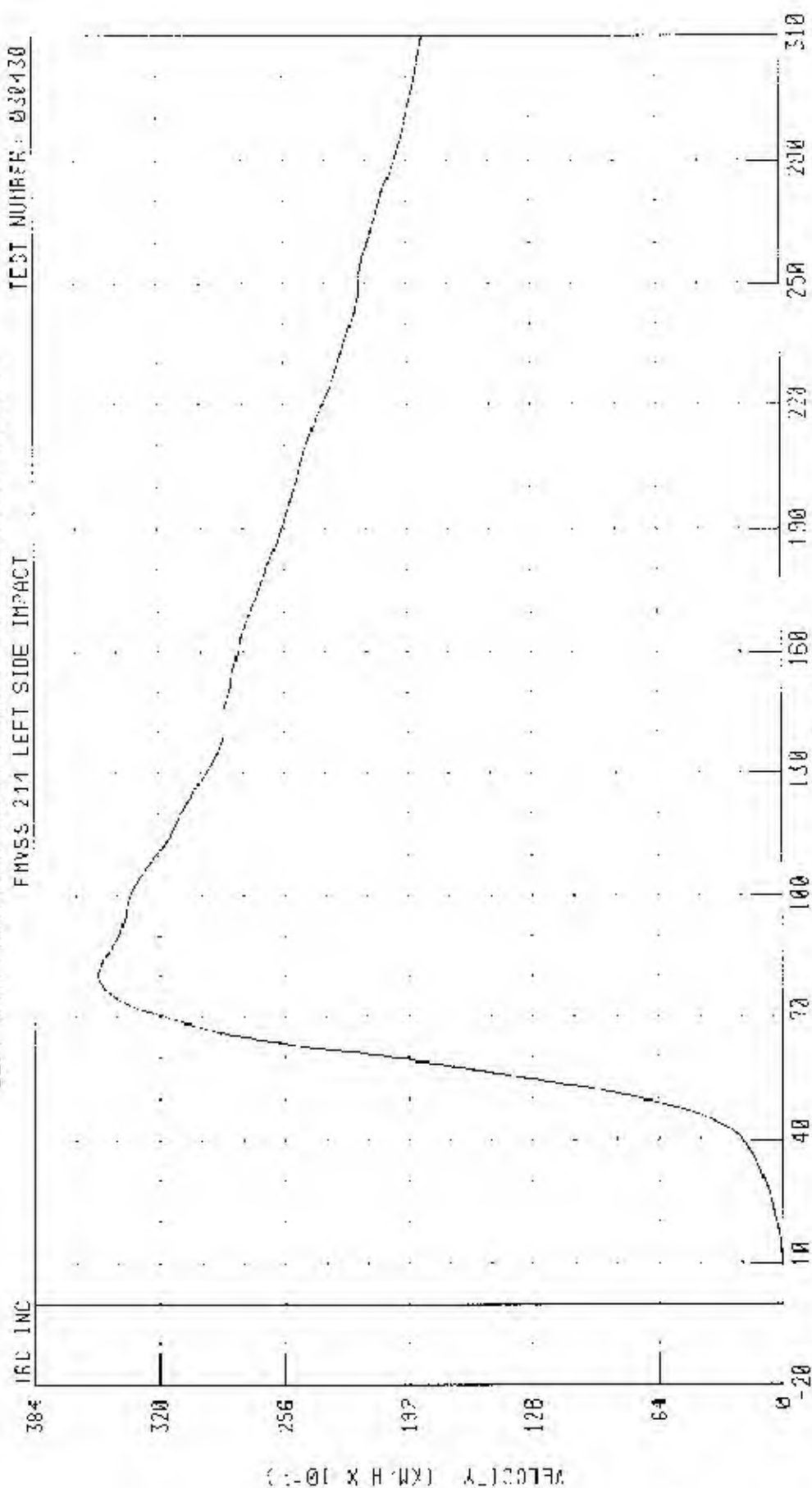
CHANNEL: T12VR4 FILTER: CH CLASS: 1000 PEAK DATE: 43 00 00 00 20 00 00 24 00 00 81 04 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER: IN'D LEFT SIDE OF 2003 BMW 325i)

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430



TIME (MS)

CHANNEL: 112YVJ FILTER: LH CLASS: 160

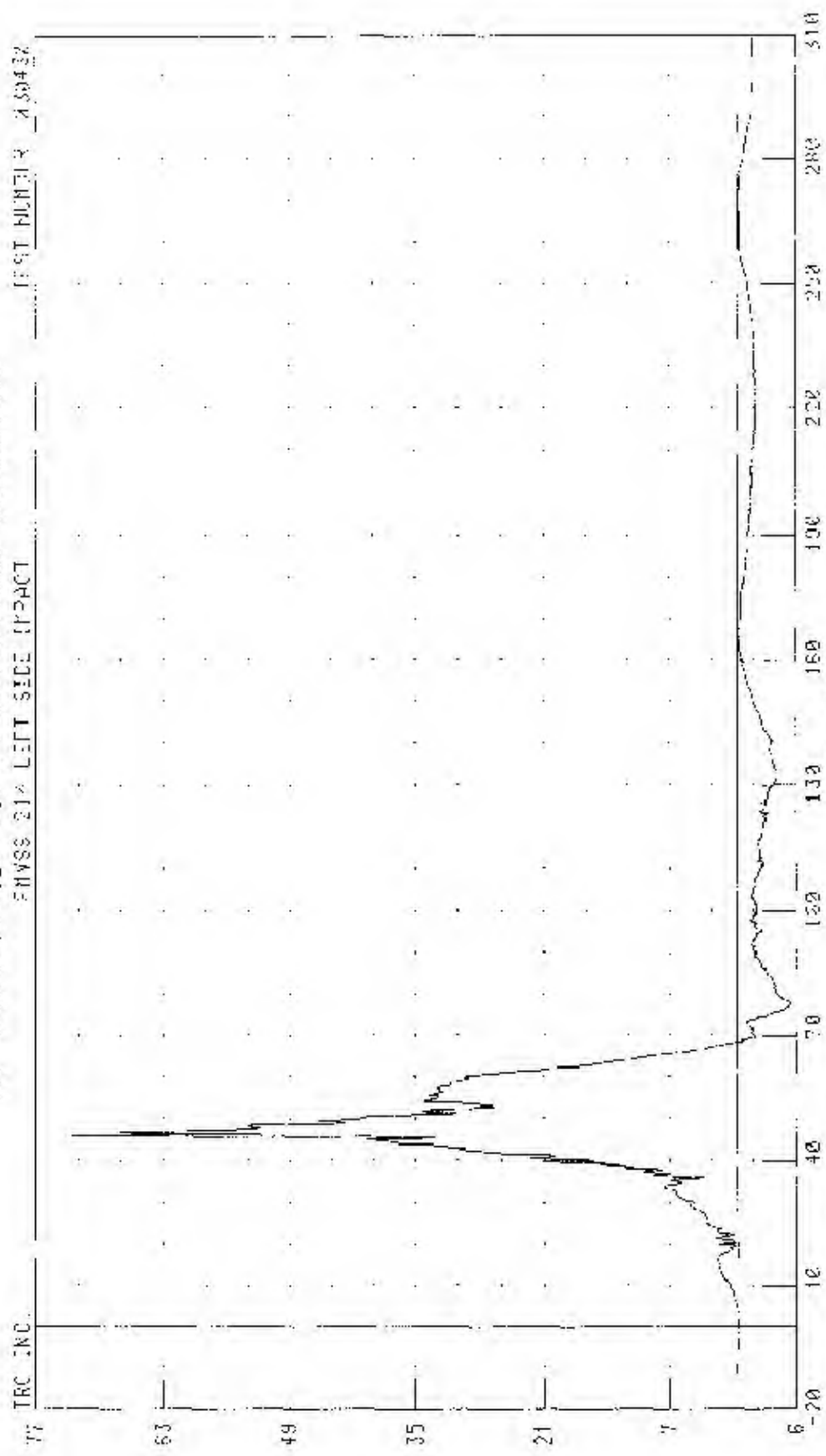
PEAK DATA: 35.1% KPH 0.80.58 MS; 2.00 KPH 0.00 MS

55-23 KP4 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO 1-1 SIDE OF 2000 RHW 525.

LEFT REAR PASSENGER PEVY'S Y-AXIS RETENTION: ACCELERATION

SVSS 214 LEFT SIDE (IMPACT)

TEST NUMBER 450432



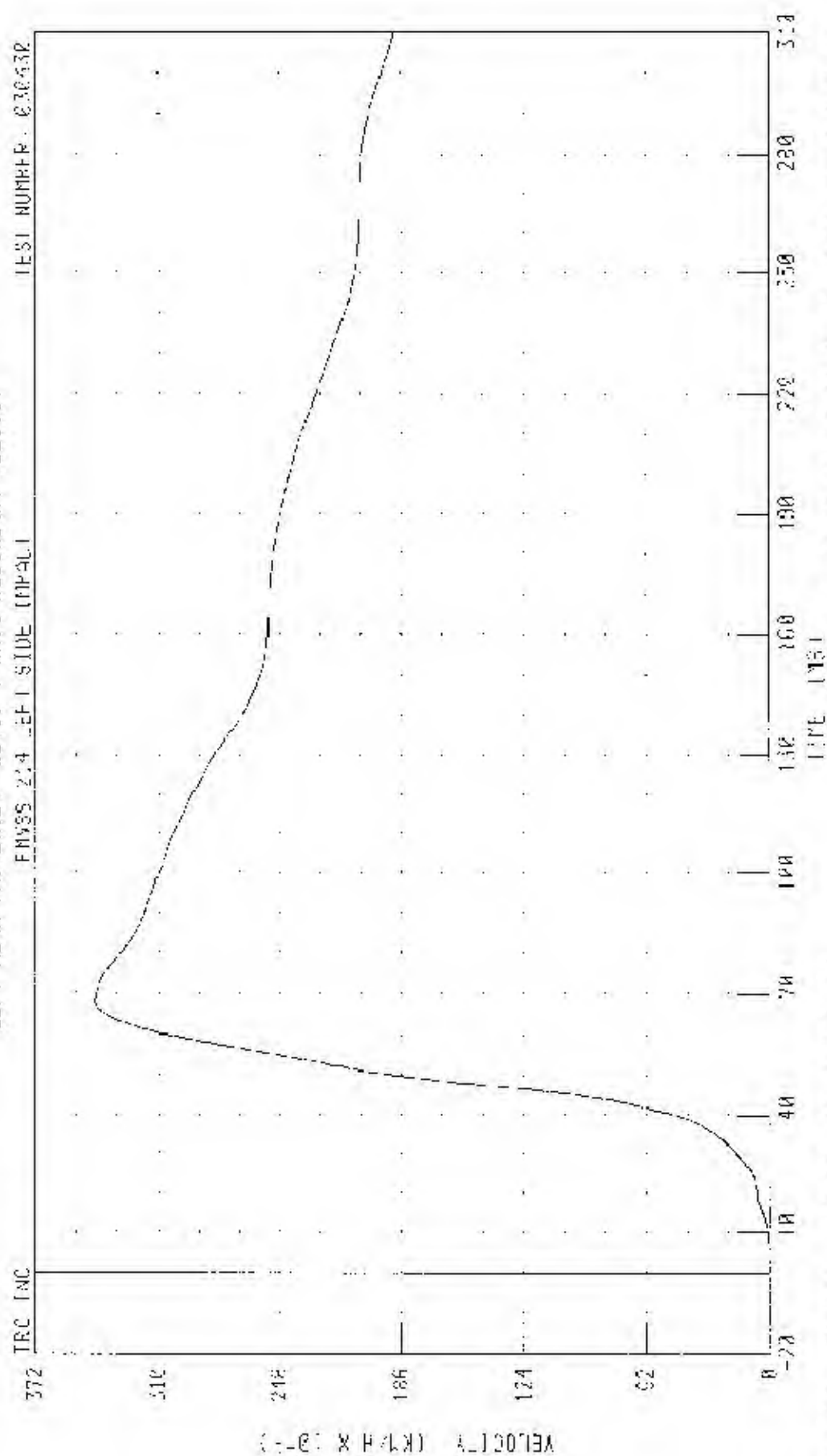
TIME (MS)

PEAK DATA 13.42 3.9 46.00 MS 5.98 5.0 77.52 18

CHANNEL PEVY34 FILTER CH CLASS 1000

NO. 1168-1-1006

55.26 <PH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i
LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT VELOCITY



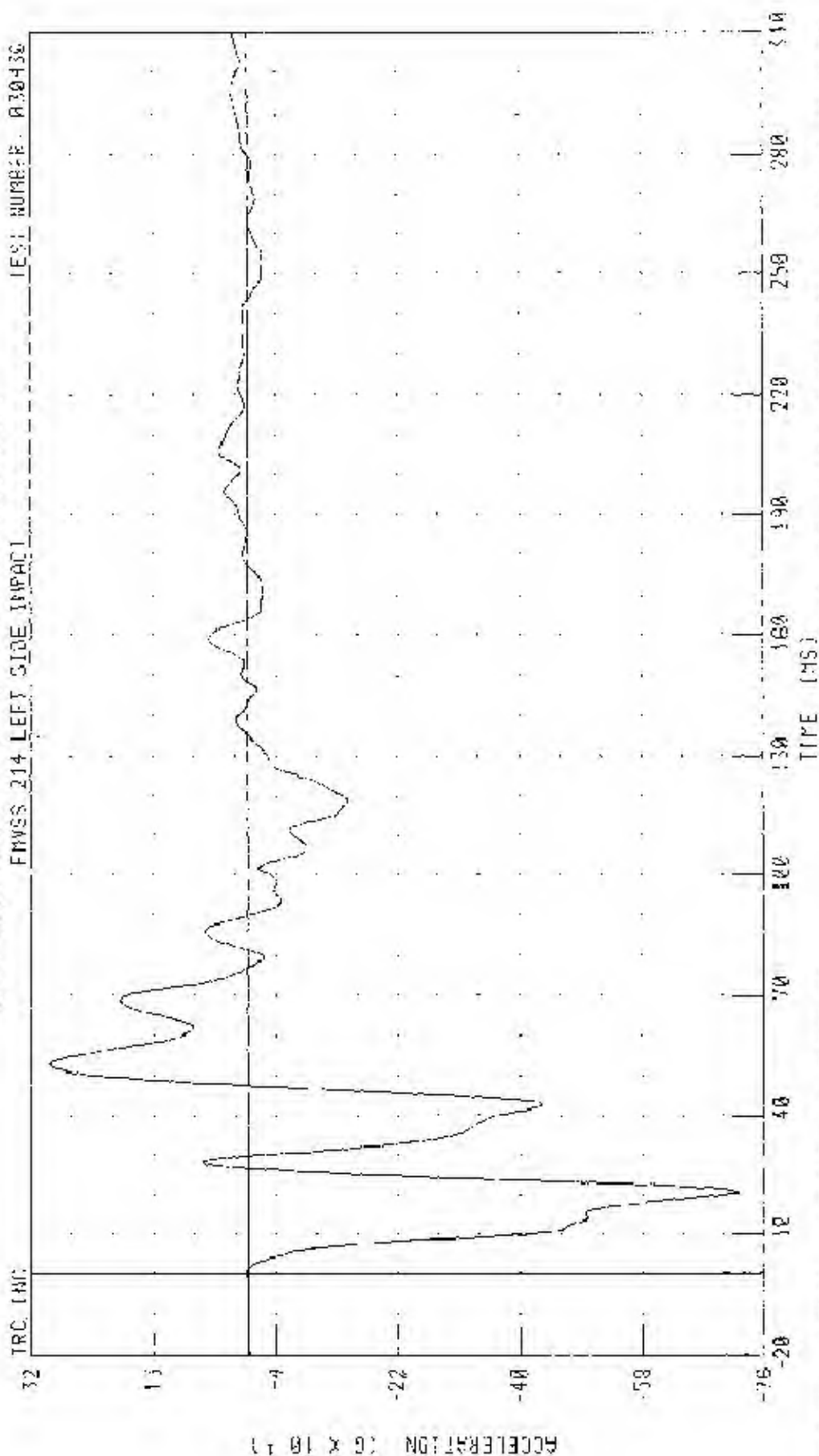
Test Vehicle Instrumentation Plots

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i
 RIGHT SIDE SILL AT FRONT SEAT X-AXIS ACCELERATION

TRC INC FMVSS 214 LEFT SIDE IMPACT TEST NUMBER: 030430



PEAK DATA: 2.54 G @ 53.64 MS, 17.23 G @ 70.88 MS

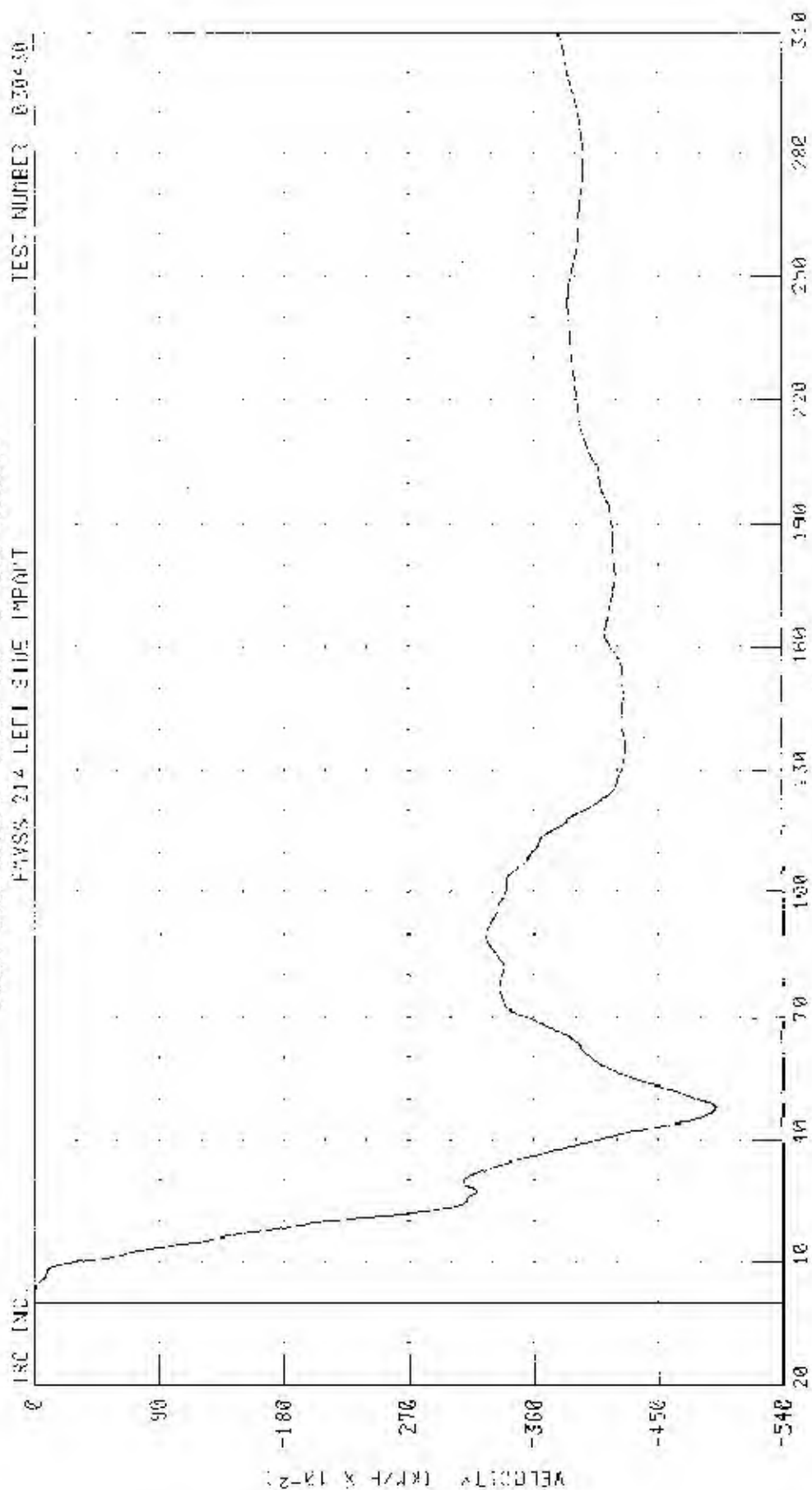
CHANNEL: RFSYC1 FILTER: CH CLASS: 50

55/23 4PH 92 DEGREE SIDE IMPACT (MOVING RETURNALE BOREHOLE) 1417 LEFT SIDE OF 200A WFW 5251

RIGHT SIDE GILL OF FRONT SEAT & AXIS VELOCITY

TEST NUMBER 030430

PHYS 214 LEFT SIDE IMPACT



IMP (PS)

PHYS 214 0 00 KM/H 0 1 17 MS: -4 91 KM/H 3 47 92 MS

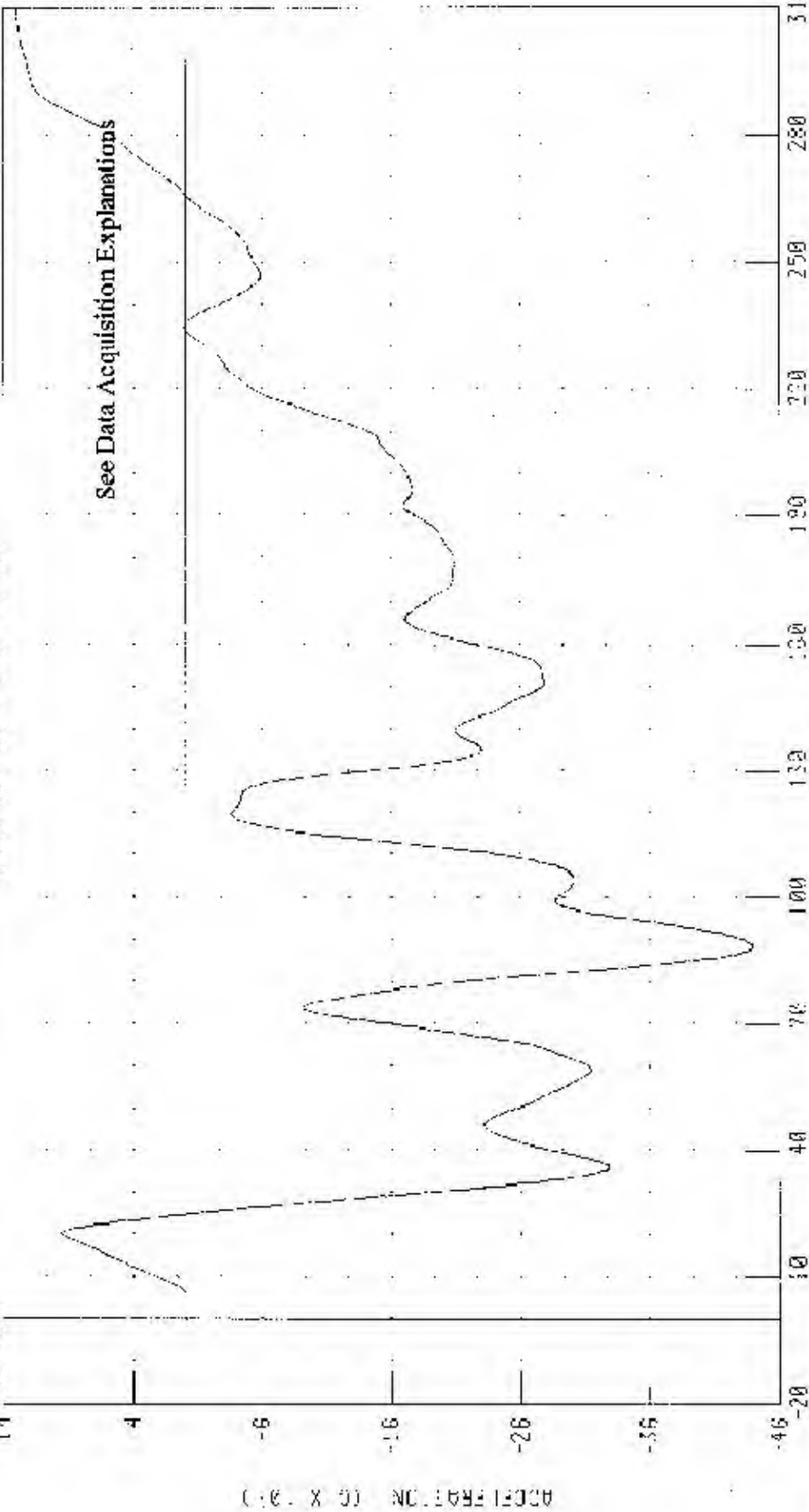
CHANNEL RFSYV1 FILTER CH CLASS 180

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

RIGHT SIDE SILL AT FRONT SEAT Y AXIS ACCELERATION

TEST NUMBER 030430

14 TRC INC.



CHANNEL RF3Y61 FILTER 01 CLASS 50

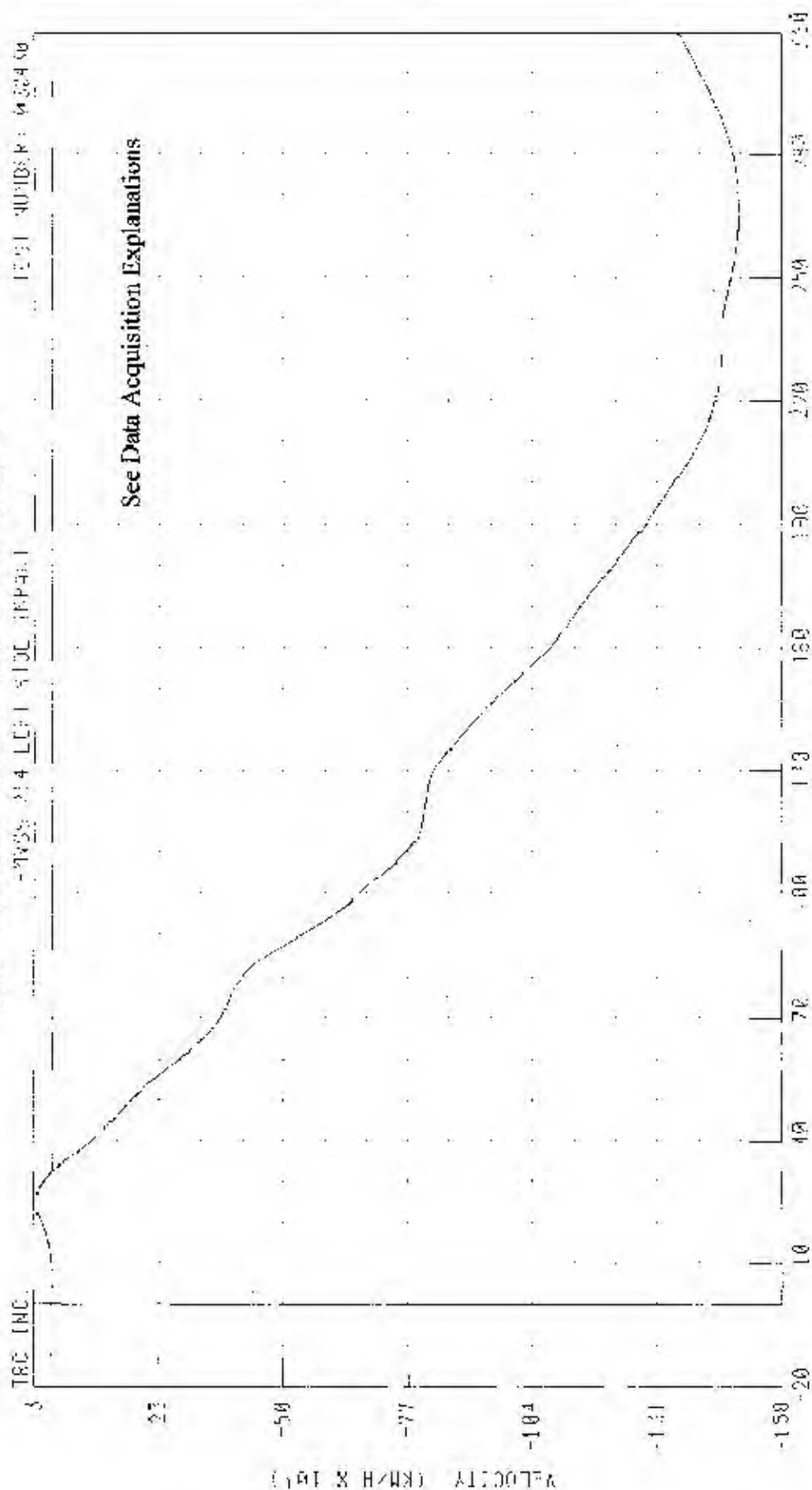
PEAK DATA 1.04 24 0.8 329 36 MS, -4.18 10 0.9 83 10 MS

550 78 301 CH DEGREE STUD INFAC' CHGVING DIFFORIGU = 0165 JPR : INTS LFI SIDE W- 2003 PW 3251

RIGHT- SIDE SILL AT FRONT SEAT : AXIS VELOCITY

— 7835 — 3:4 LC:1 5:10C 10P:10:1

1231 40108K : 4324 60



LINE 19:

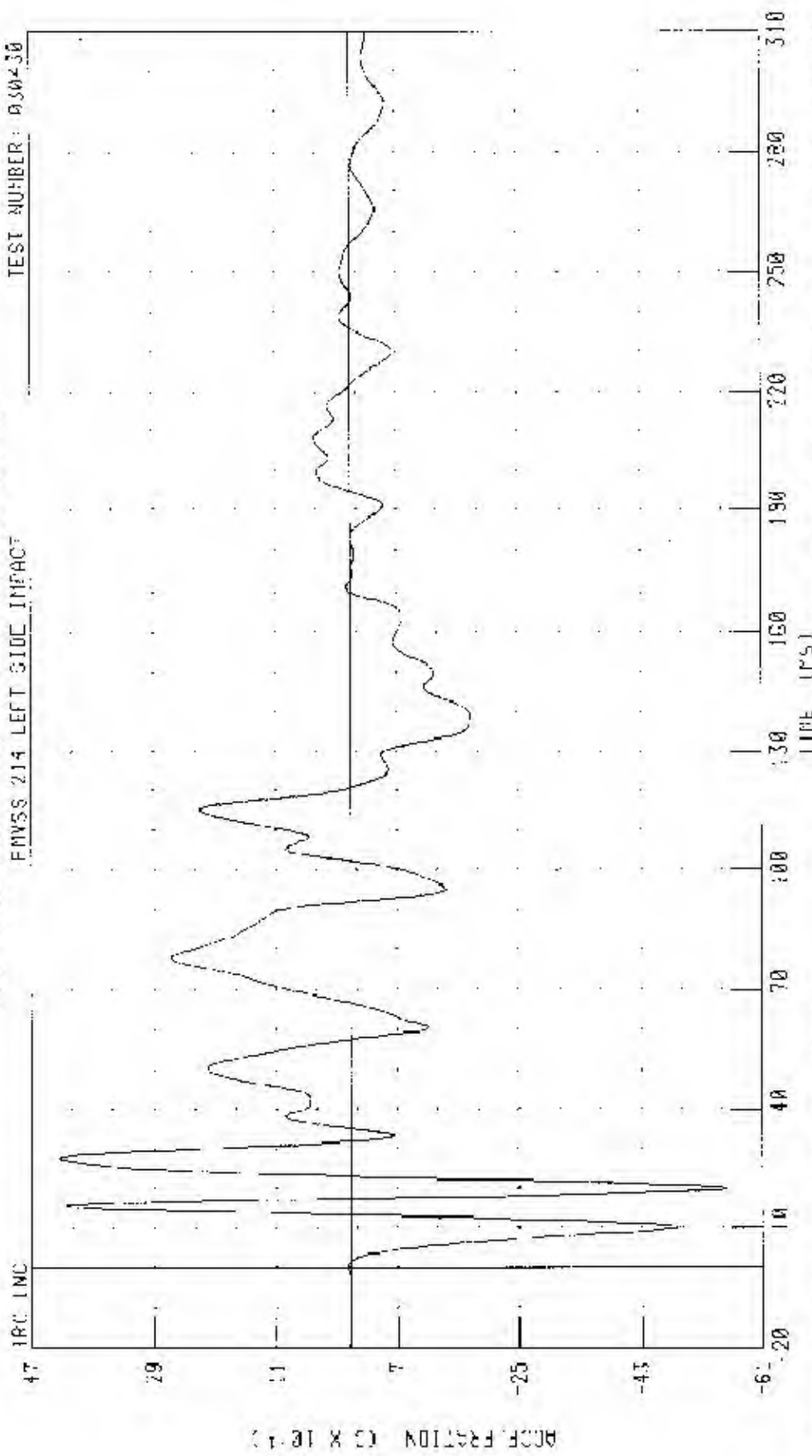
CHANNEL - 34501 FILLER - CL993 103

PLATE 11. *2* \times 35 mm. 22×0 MS. - 1935.5. 19. 25. 33. 115.

55/28 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

RIGHT SIDE SILL AT FRONT SEAT Z AXIS ACCELERATION

ENVSS 214 LEFT SIDE IMPACT TEST NUMBER: 030430



CHANNEL RFSZG1 SILLER CH CLASS 60

PEAK DATA: 1 29 0 0 27 76 MS, -3 56 G @ 19 92 MS

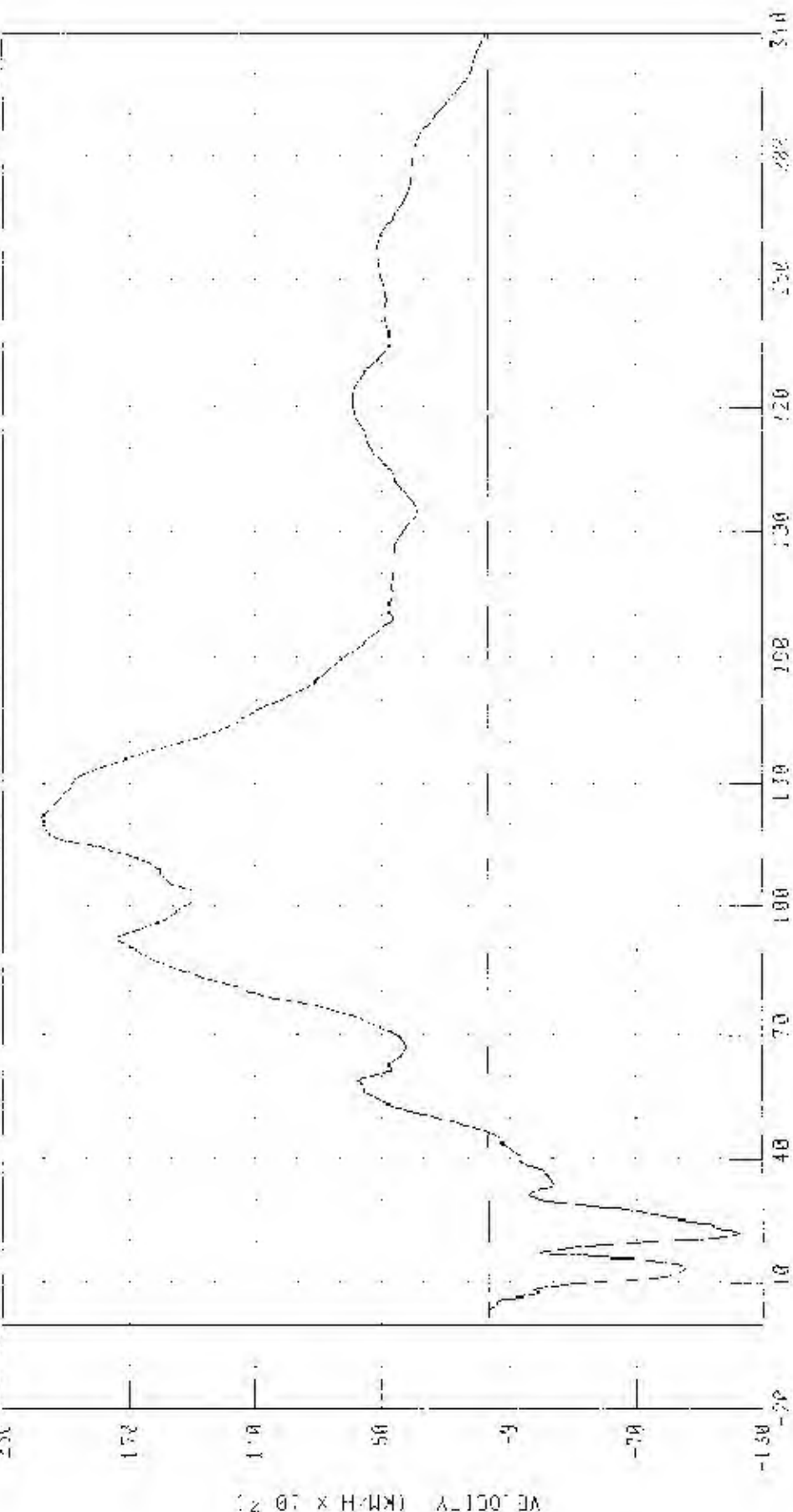
54728 KPH 9M DEGREE SIDE IMPACT (MOVING OFFROADABLE SPARKER) INTO LEFT SIDE OF 250E R/W 50M

RIGHT SIDE GLE AT FRONT SEAT Z-AXIS VELOCITY

TRC INC

PHYS 214 LEFT SIDE IMPACT

TEST NUMBER 033430



TIME (MS)

CHANNEL: R02V1 FILTER: CH, 0.050 160

PEAK DATA: 2 17 KM/H 3 151 32 133 1 18 41 1 2 22 06 18

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DETURNABLE BARRIER) INTO LEFT SIDE OF 2023 HWY 325.1

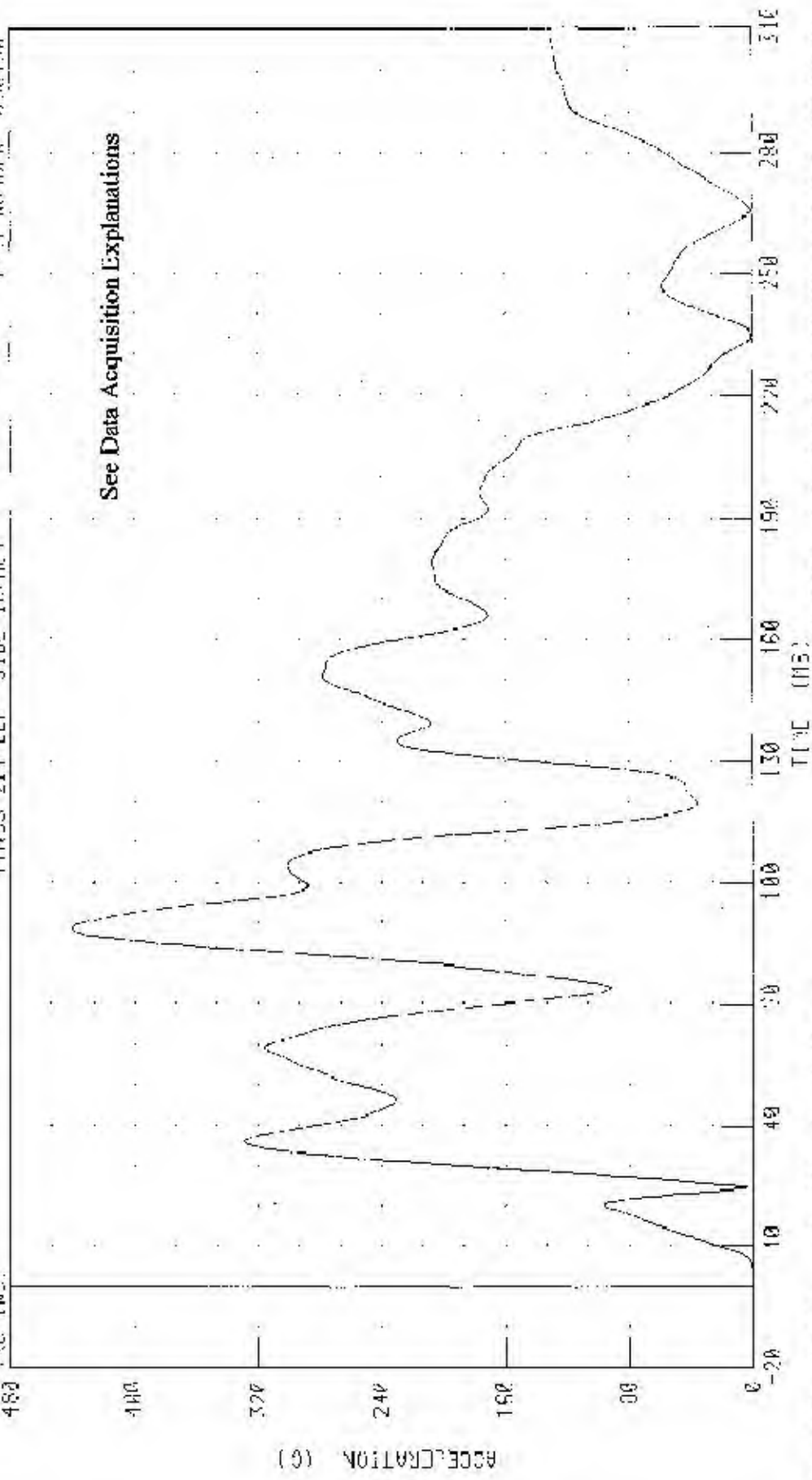
RUCR1 SIDE SILL AT PCHN' SEAT RESUL'ANT ACCELERATION

TEST NUMBER W 4432

FMVSS 214 LEFT SIDE IMPACT

TRC INC.

See Data Acquisition Explanations



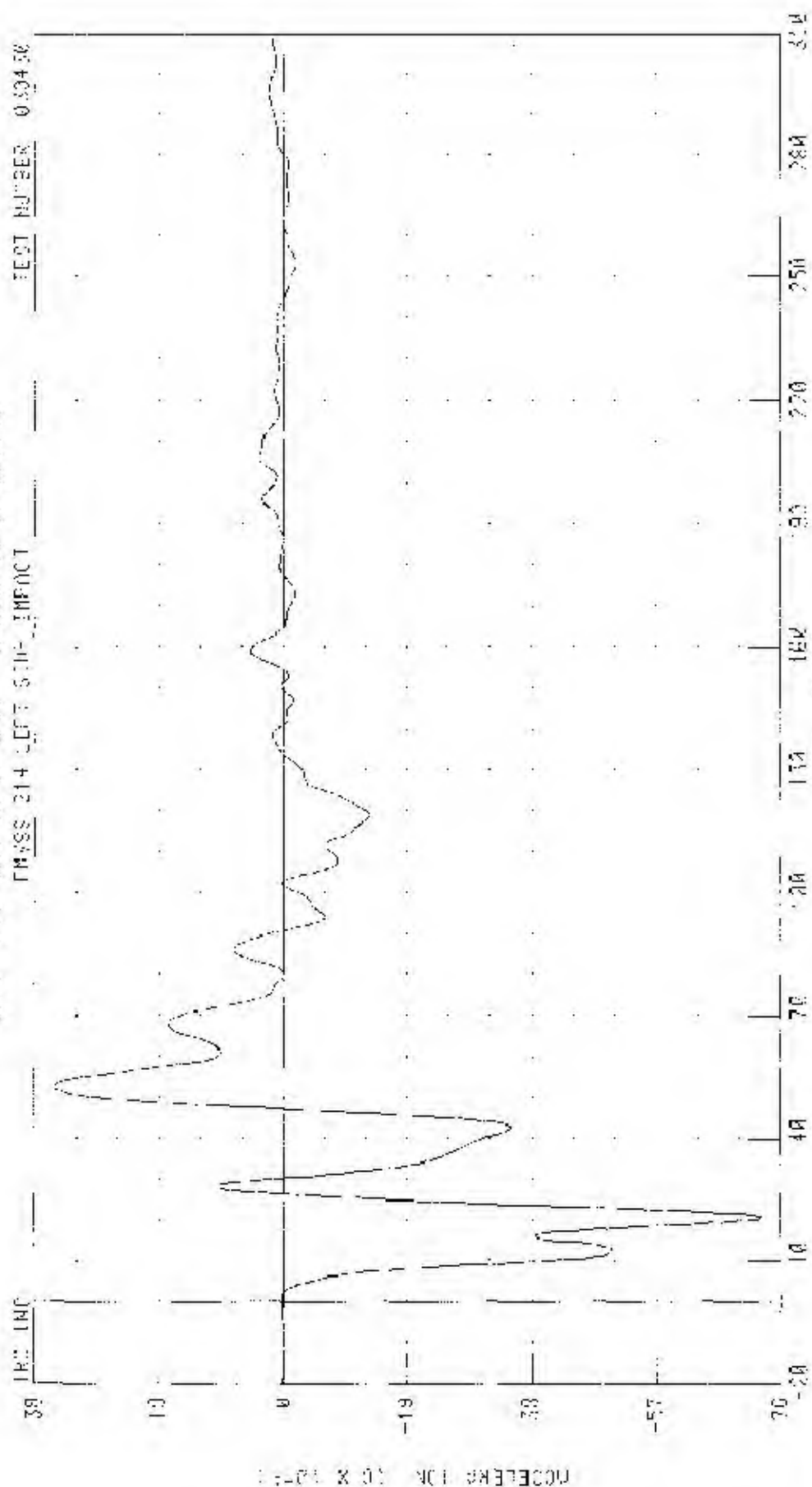
PEAK DATA 410 ± 30 88 40 MS. 0.25 G @ 1984 MS

CHANNEL R=500; FILTER=CH CLASS 60

55-23 K/11 80 GILBELL SIDE IMPACT MOVING GEOPHAPHIC BARRIERS INTO LEFT SIDE OF 2093 RHW 3251

RIGHT SIDE SLIT ON REAR SPR X-0X15 DIFFERENTIAL

MASS 214 LEFT SIDE IMPACT TEST NUMBER 030430



GILBELL BRIDGE FILTER ON CLIP 03

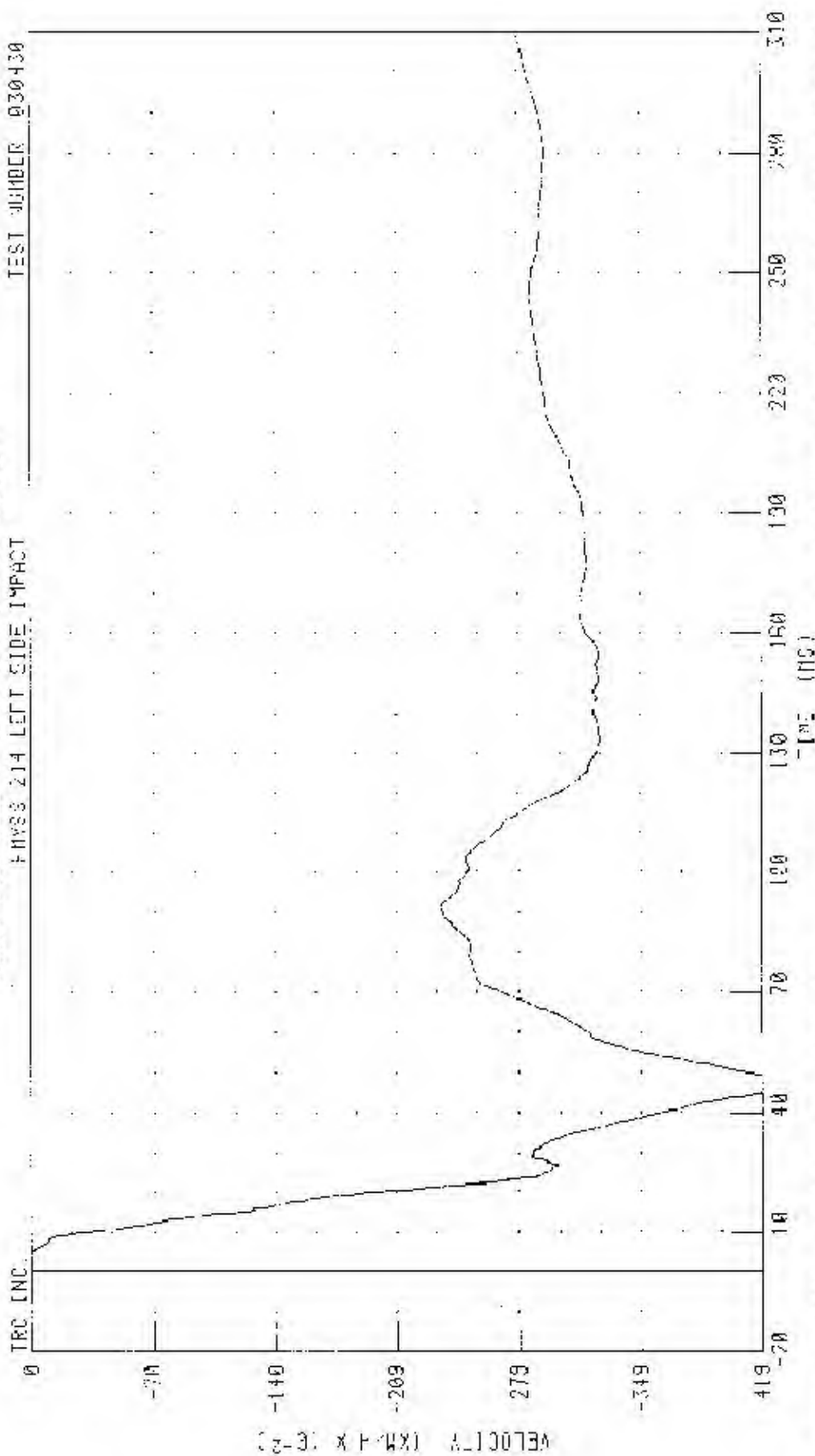
PEAK DATA: 5.48 G @ 5.250 MS, 7.29 G @ 25.88 MS

55/28 RPM 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2023 R/V 3251

RIGHT SIDE SILL OF REAR SEAT X-AXIS VELOCITY

TEST NUMBER 030430

INSTR 214 LEFT SIDE IMPACT

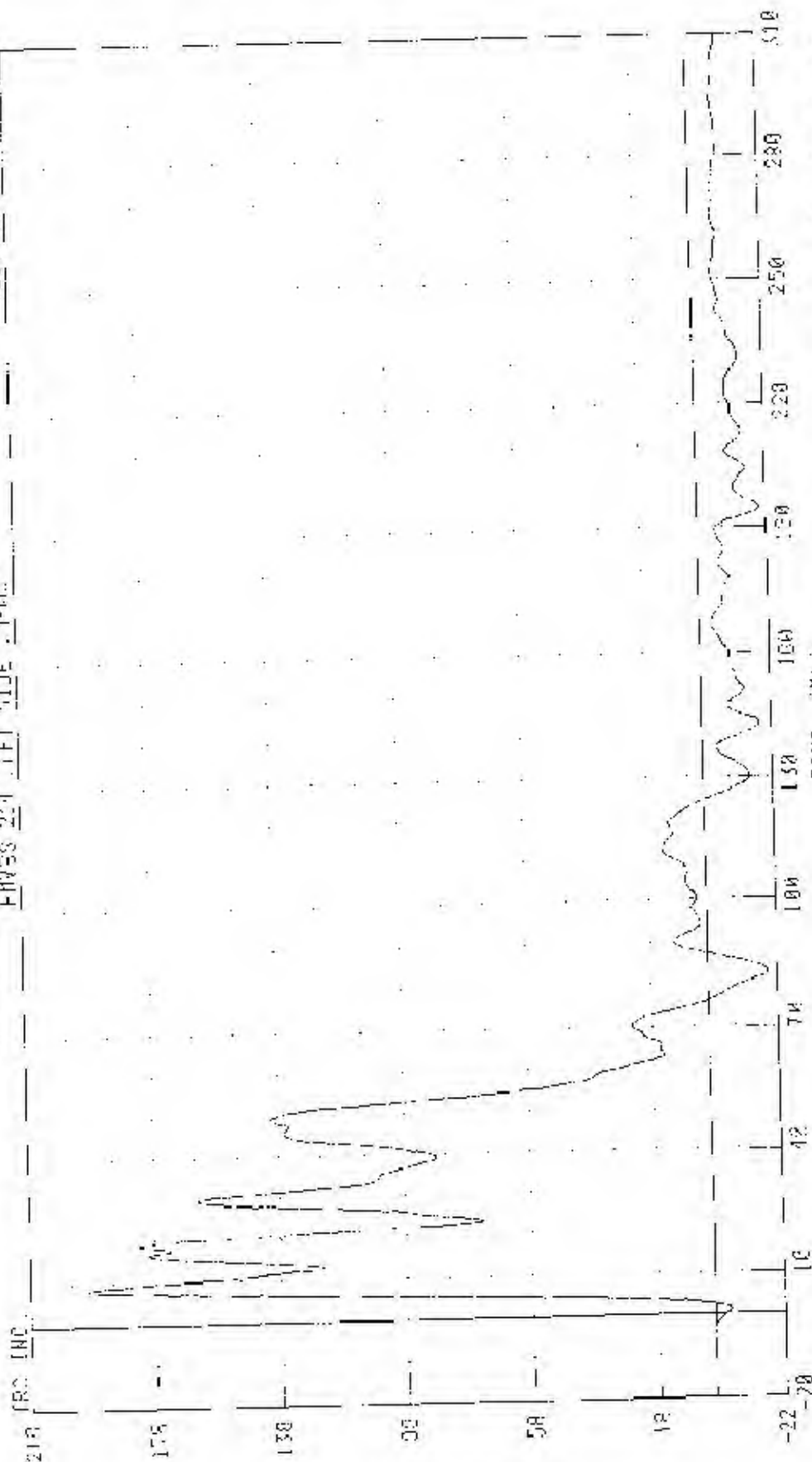


CHANNEL 1 ERSXY1 FILTER CIR. CLASS 100

PLK DATA 0 20 KHZ 0 7 44 MS; -- 20 KHZ 1 0 47 50 MS

55720 MPH 92 DEGREE SIDE IMPACT CRASHING DEFORMABLE BARRIER AND LEFT SIDE OF 2203 HWY 155
 RIGHT SIDE SILL A REAR SEAT X AXIS ACCELERATION

PHASE 274 LEFT SIDE IMPACT TEST NUMBER 000000

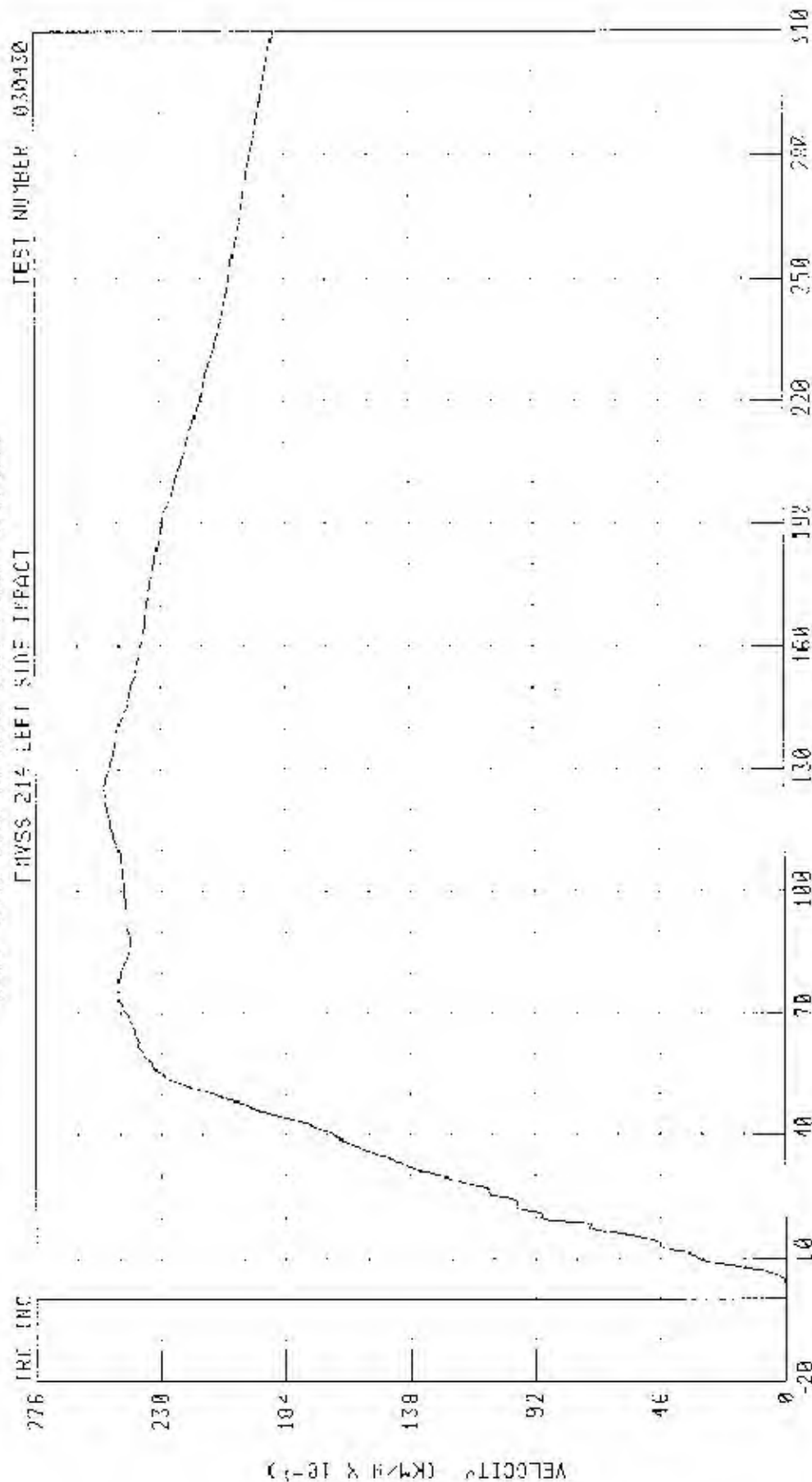


TIME (MS) 0 50 100 150 200 250 300
 PLATE DATA 13 98 0 0 3 48 00 1 01 0 3 004 72 05

C-314FI R39791 FILTER CH CLOSE 00

55.28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 RVW 3251

RIGHT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY



CHANNEL: RRSY41 FILTER: CH CLASS: 180

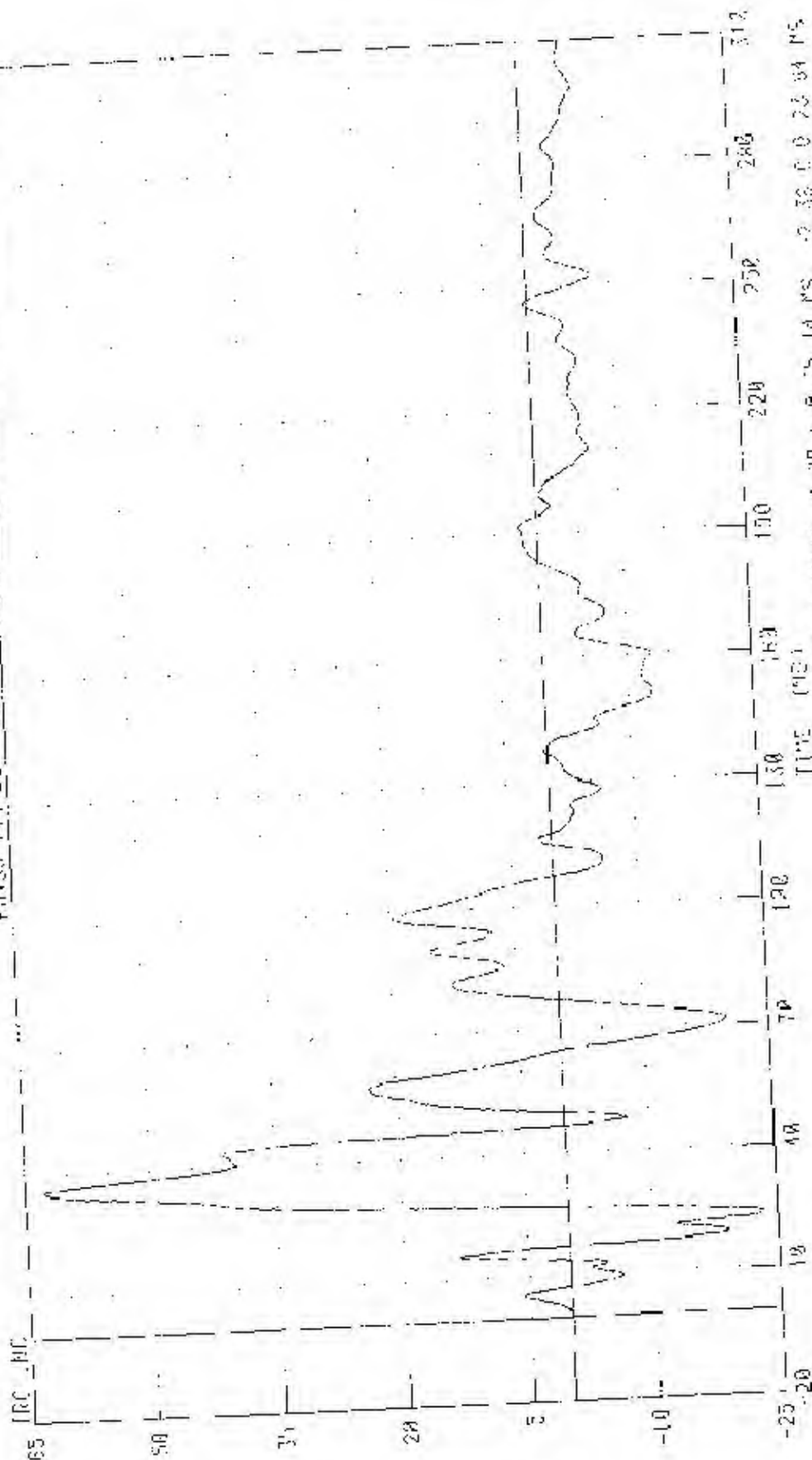
PPPK DATE: 25 49 KM/H 13 125 20 MS, 0 00 KM/H 0 0 05 MS

35770 KPH 90 DEGREE SIDE IMPACT (MOVING OFFSHORE) IMPACT INTO LEFT SIDE OF 2003 CRW (25)

RIGHT SIDE SILL OF HAW SENT 2-3013 ACCELERATION

TEST NUMBER: 030430

PROCES 214 LEFT SIDE IMAC



PEAK TIME: 6.29 6.25 14 MS -2.38 0.0 7.6 34 MS

CIRCUIT: RES201 FILTER: 0.1 CLASS: 60

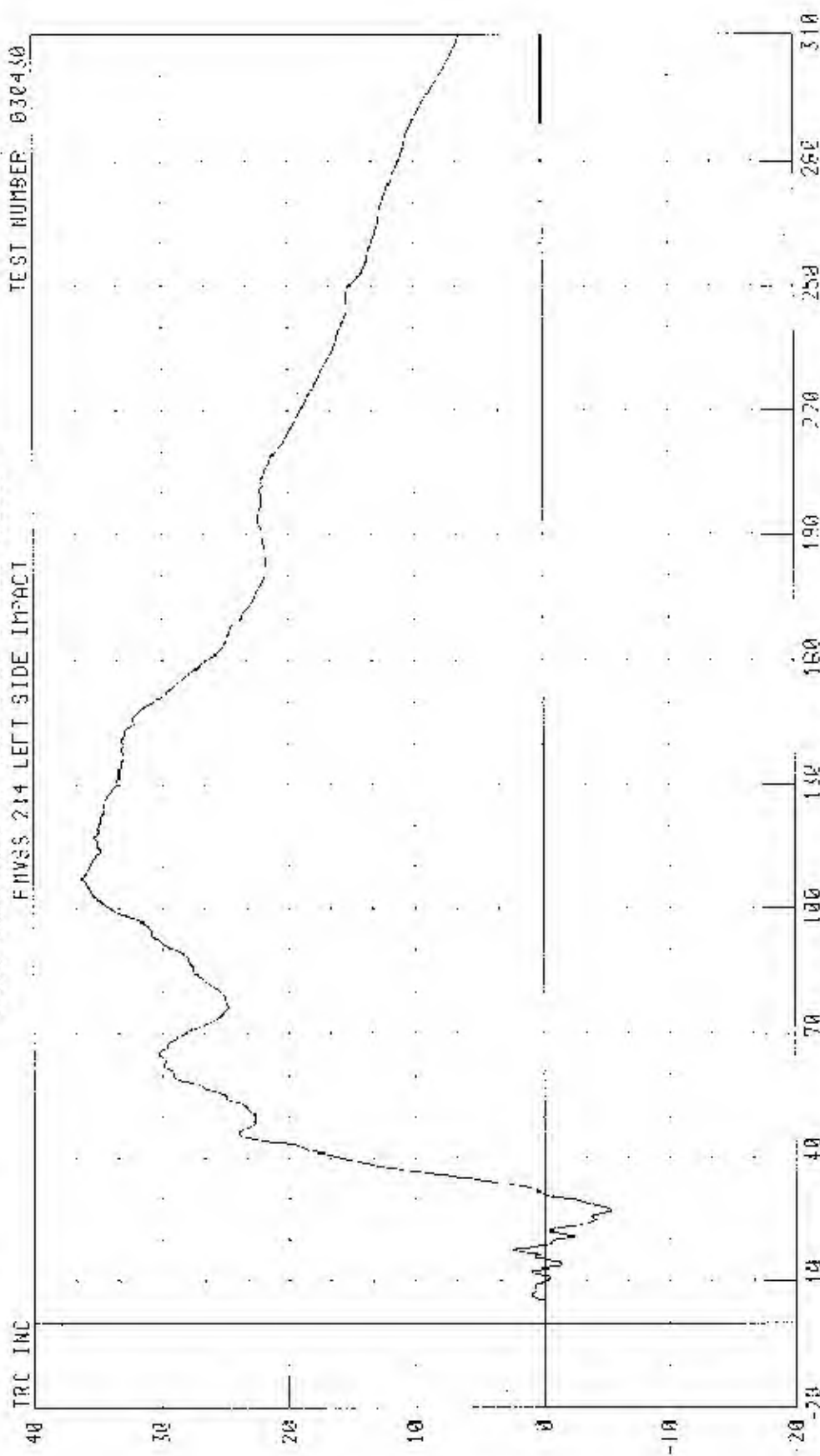
030430

55/28 200 90 DEGREE SLOPE IMPACT (MOVING DEFORMABLE BARRIER INTO LEFT SLOPE OF 200.3 BW 325)

RIGHT SIDE SILL AT REAR SEAT Z-AXIS VELOCITY

TEST NUMBER 030430

FMVSS 214 LEFT SIDE IMPACT



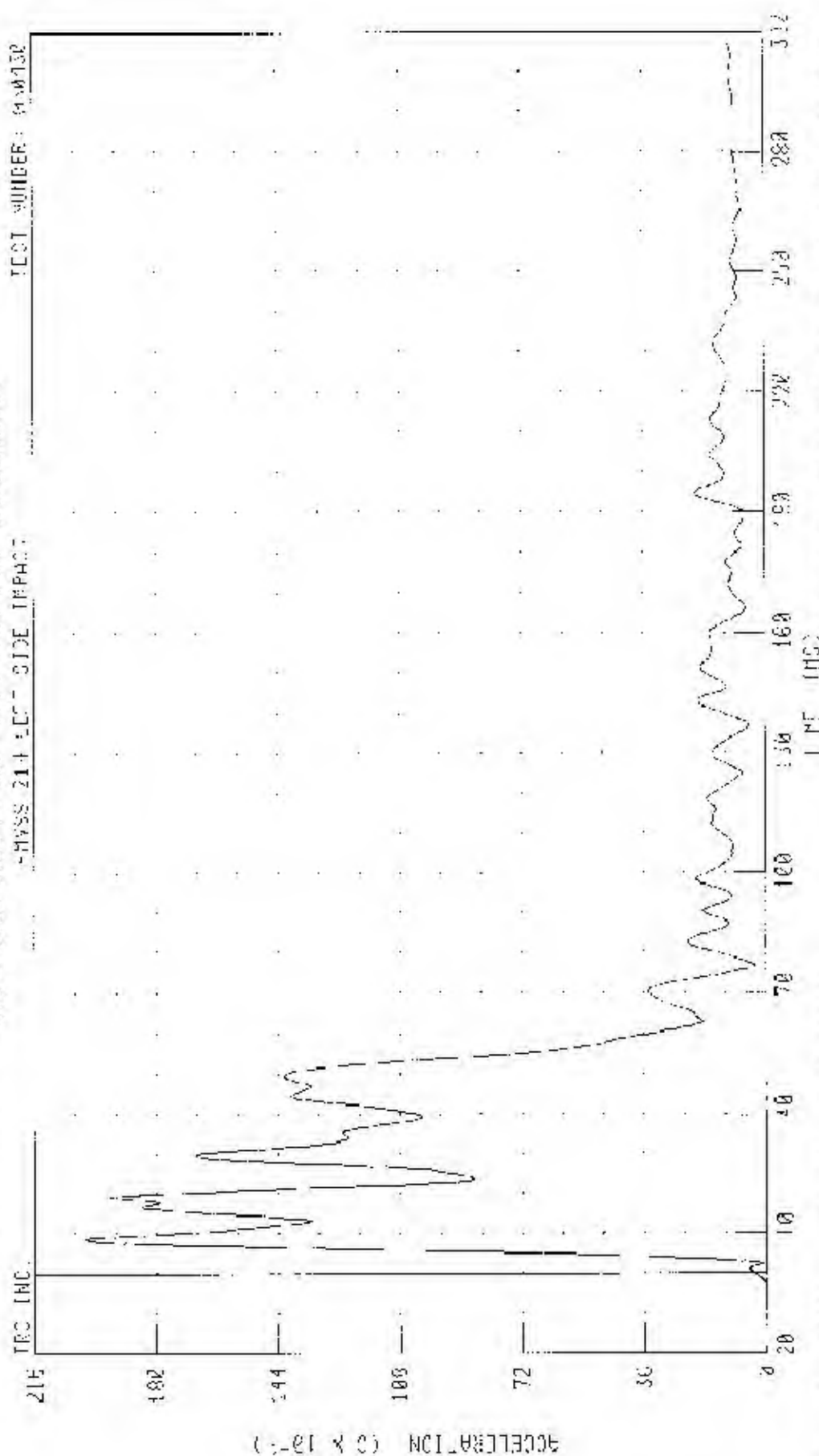
VELOCITY (KM/H X 10³)

TIME (MS)

CHANNEL: KMS291 FILTER: CH. CLASS: 130

PEAK DATA: 1.62 KPH @ 107.04 MS, -0.53 KPH @ 277.12 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARREL) INTO FET 500H OF 2003 BMW 325i
 RIGHT SIDE SILL AT REAR SEAT HEAD REST (ANT ACCELERATION)



PEAK DATA 20 17 3 8 6 40 MS, 4.00 3.0 17.95 MS

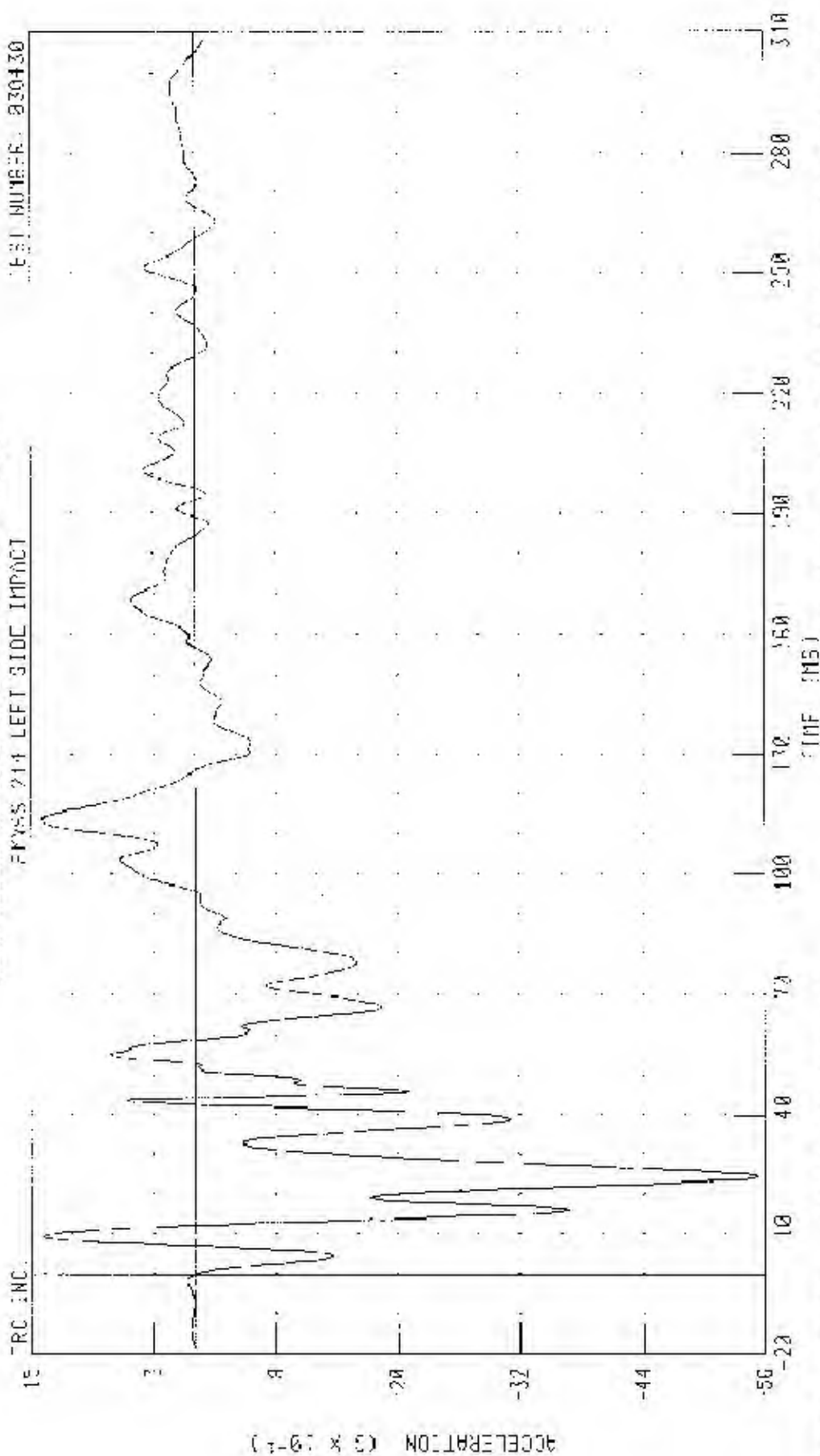
CHANNEL: REARCL FILTER: CH CLASS: EA

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 BMW 325i)

REAR FLOORPAN ABOVE AXLE X-AXIS ACCELERATION

FXSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430



CHANNEL: ADRX01 FILTER: CUI CROSS: RZ

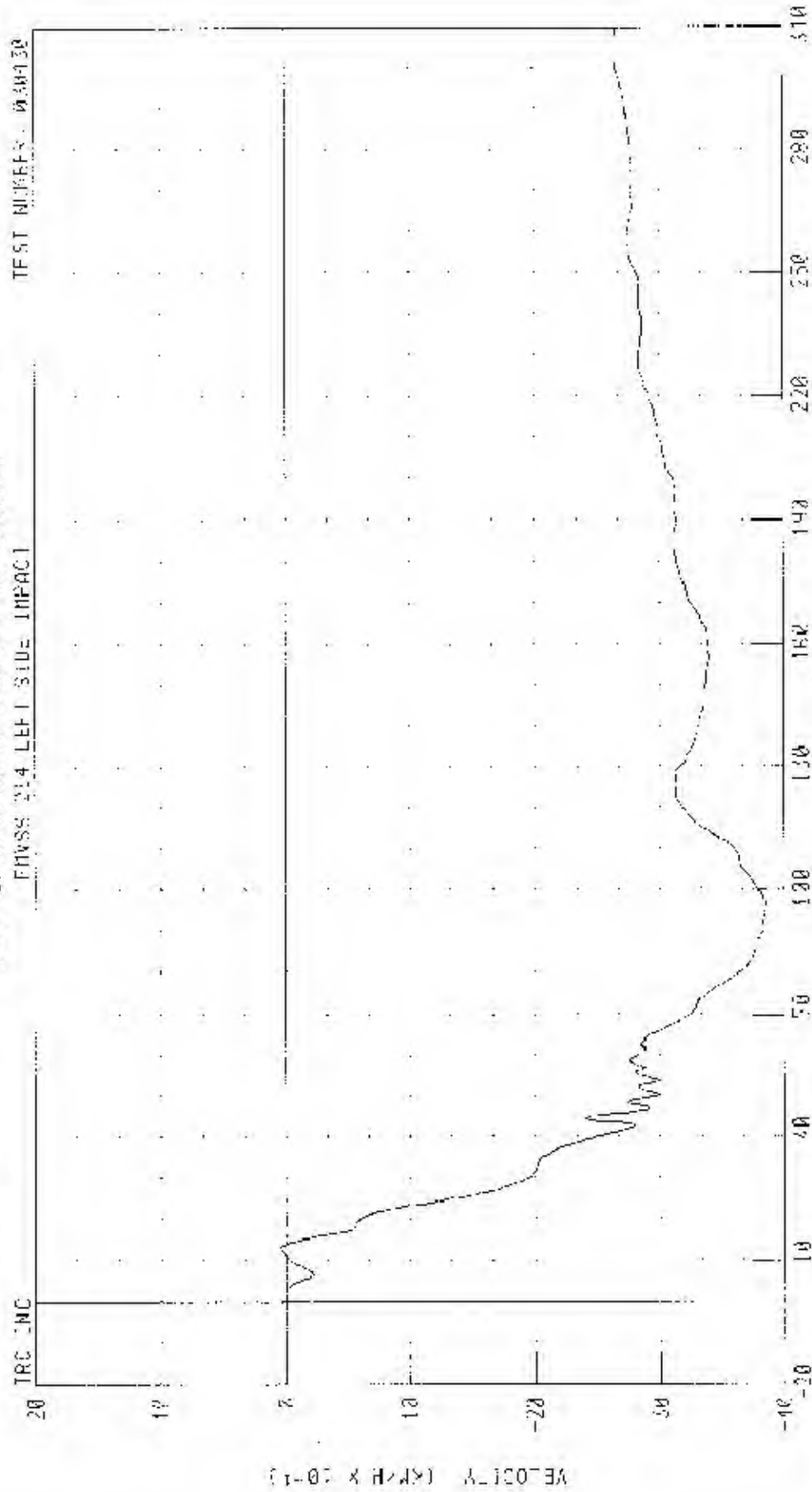
PEAK DATA: 15.0 G @ 113.94 MS, -5.53 G @ 24.18 MS

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFENSIBLE BARRIER) - V19 LEFT SIDE OF 2003 DMV 3251

REAR FLOORPAN ABOVE AXLE X AXIS VELOCITY

TEST NUMBER: 030430

FMVSS 214 LEFT SIDE IMPACT



TIME (ms)

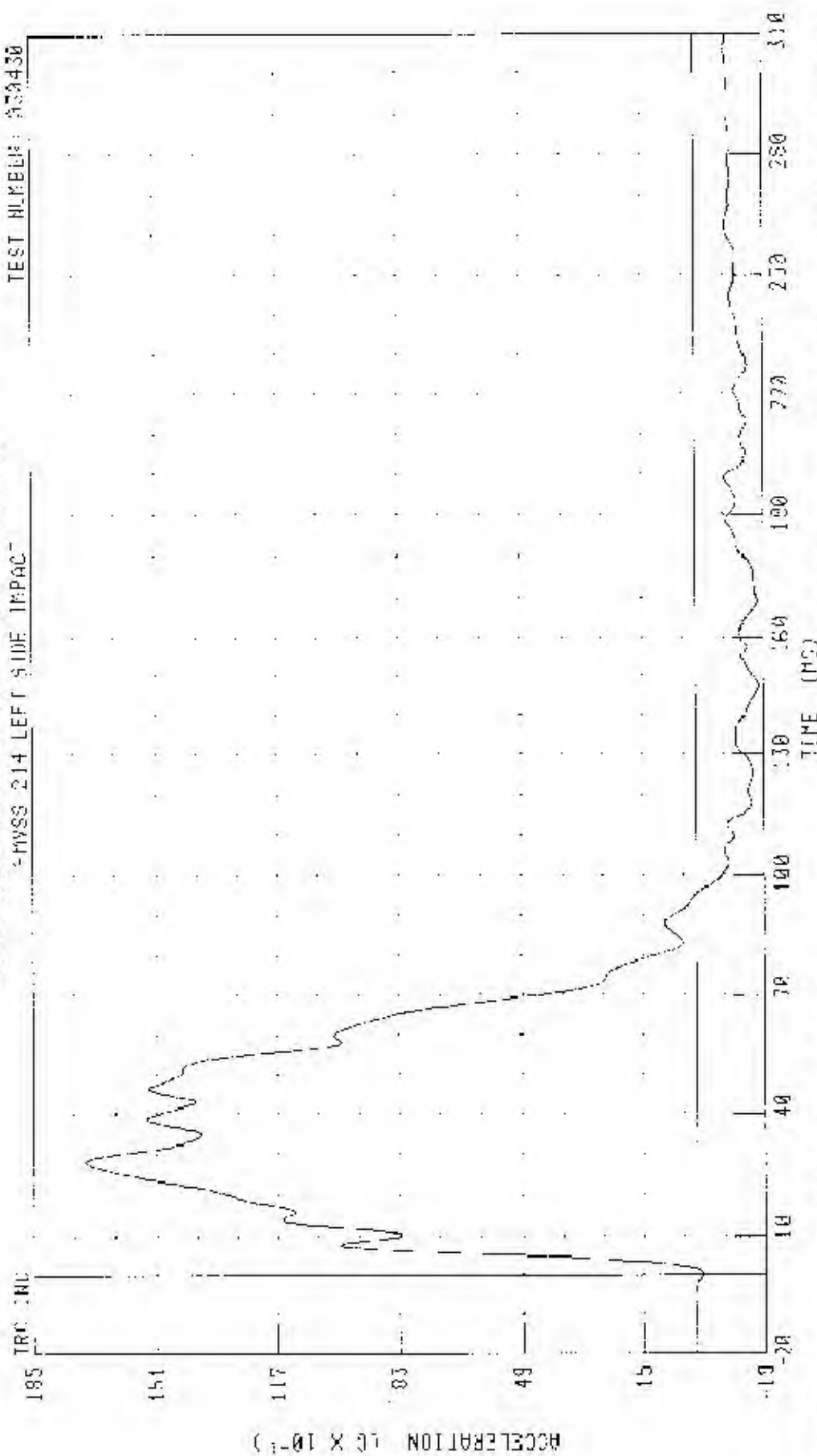
CUMULATIVE REACTION FILTER: CI CLOS 100

PEAK DATA: 0.05 KPH x 10⁻¹ 13.30 MS, -3.85 KPH x 10⁻¹ 28.98 MS

55.20 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMER, BARRIER) INTO LEFT SIDE OF 2003 BMW 325

REAR FLOORPAN ABOVE AXLE 7-4X15 ACCELERATION

TEST NUMBER: 030430



CHANNEL: R12Y61 FILTER: CH CLASS: 60

TEST DATE: 17 DEC 00 20 00 MS, -1 75 0 0 117 33 MS

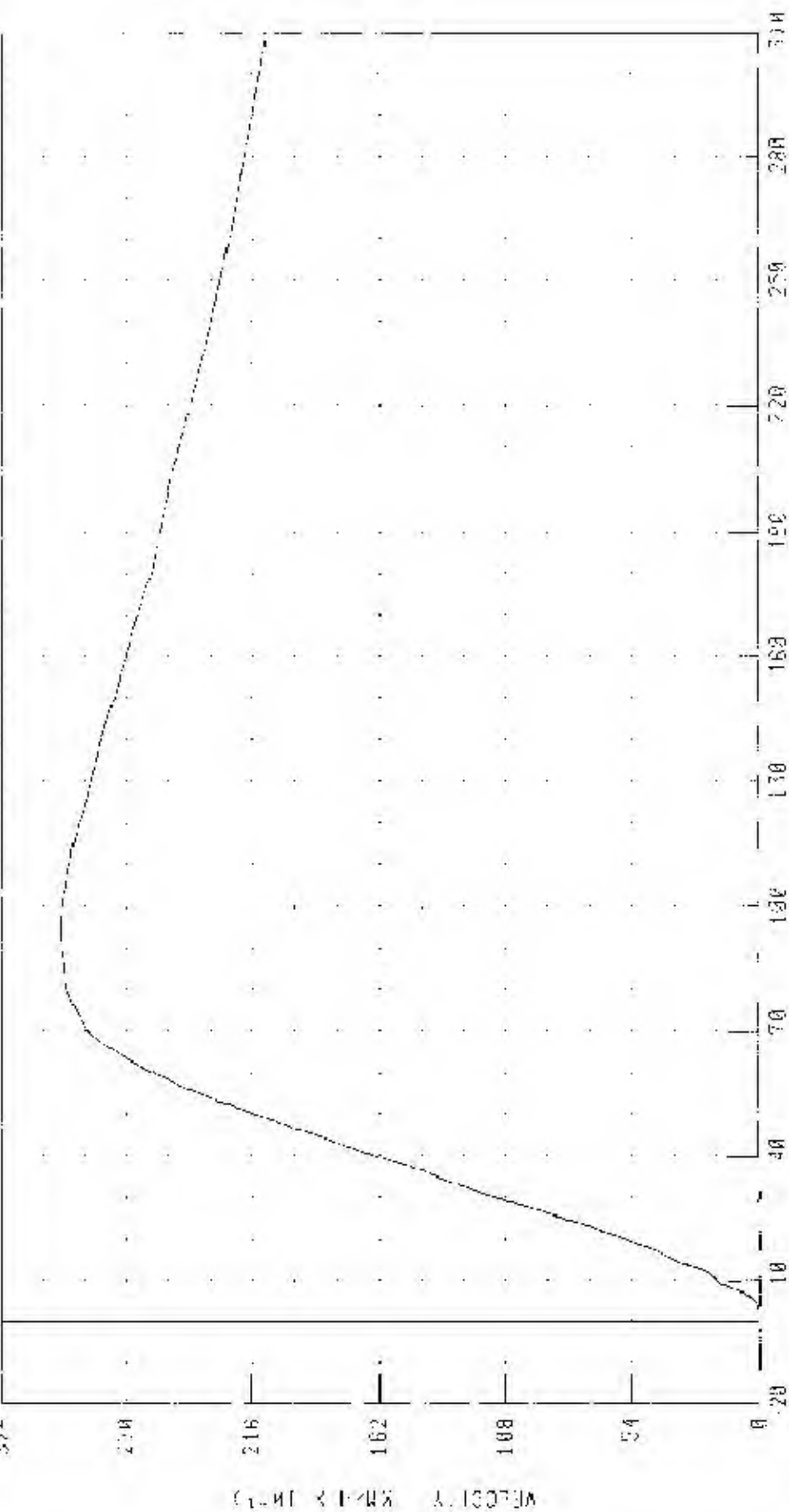
55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325I

REAR BLOODPAIN ABOUT HALF Y-PRIS VELOCITY

TEST NUMBER 030430

PHYSS 214 LEFT SIDE IMPACT

IRC IND.



TIME (ms)

PEAK DATA: 24.85 MPH @ 96.88 ms; 9.83 MPH @ 0.00 ms

CHANNEL ROKYV1 FILTER OF CLASS 180

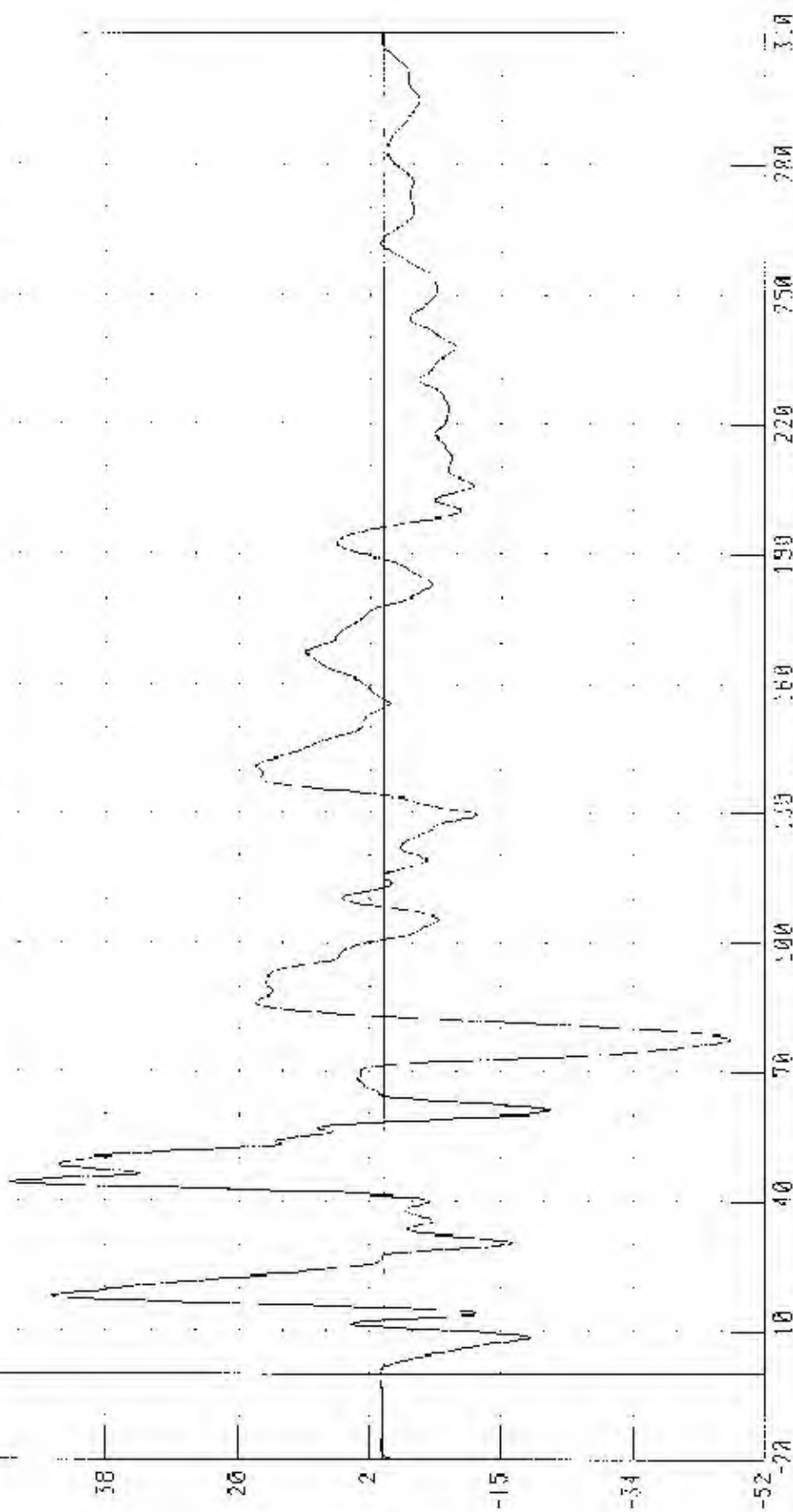
55/20 (P4 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i)

REAR FLOORPAN ABOVE AXLE Z-AXIS ACCELERATION

PNVS 214 LEFT SIDE IMPACT

TRC INC.

TEST NUMBER 030430



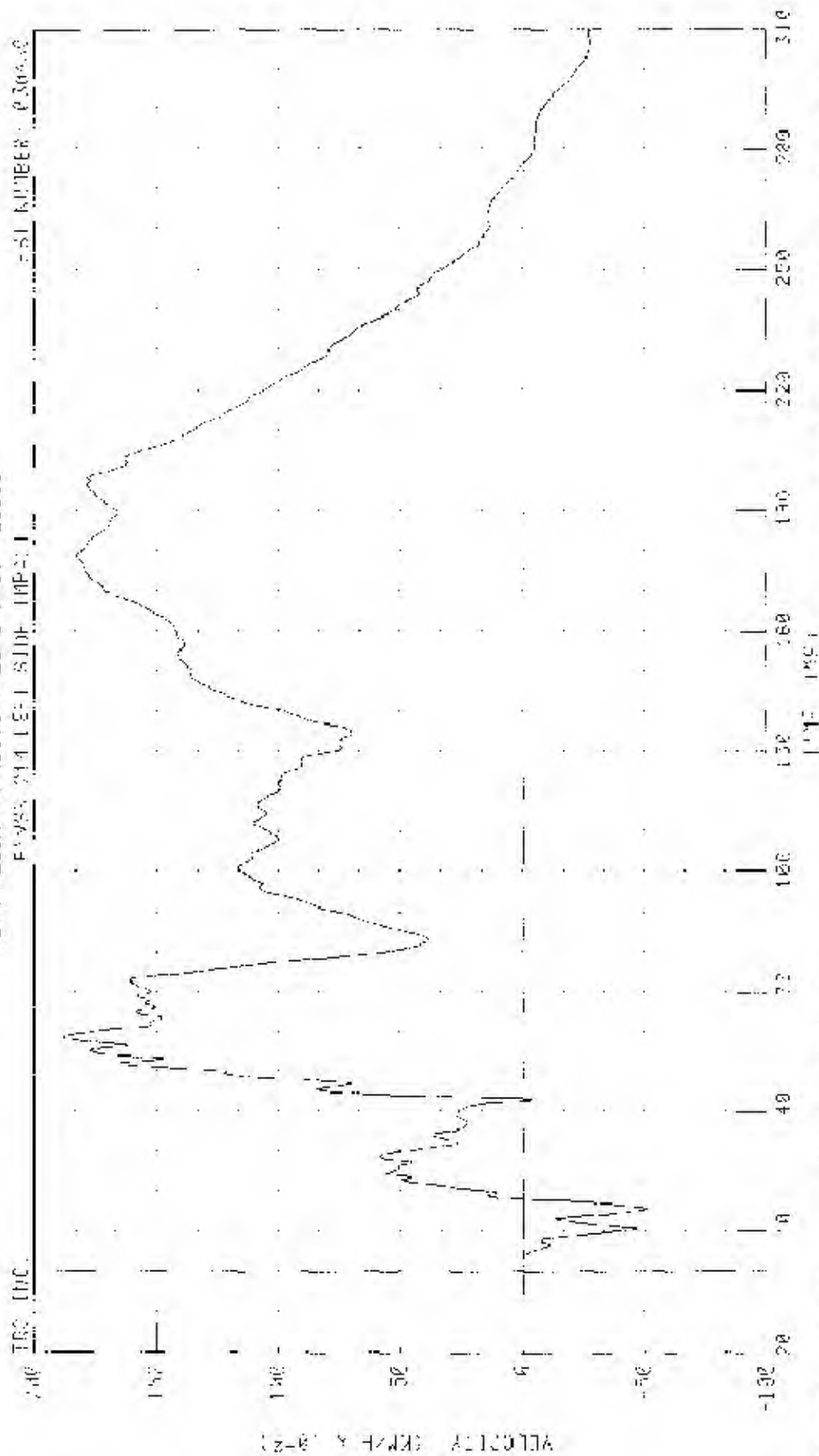
TIME (MS)

CHANNEL R0K731 FILTER CH CLASS EQ

PEAK DATA 5.11 G @ 45.10 MS, + 93.0 @ 78.00 MS

ACCELERATION (G x 10^4)

50-25 MPH 90 DEGREE SIDE IMPACT SHOWING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 BMW 325I
 REAR FLOORPAN ABOVE ANGLE 2-AXIS VELOCITY



CHANNEL: 20K791 FILTER: 0.153 100

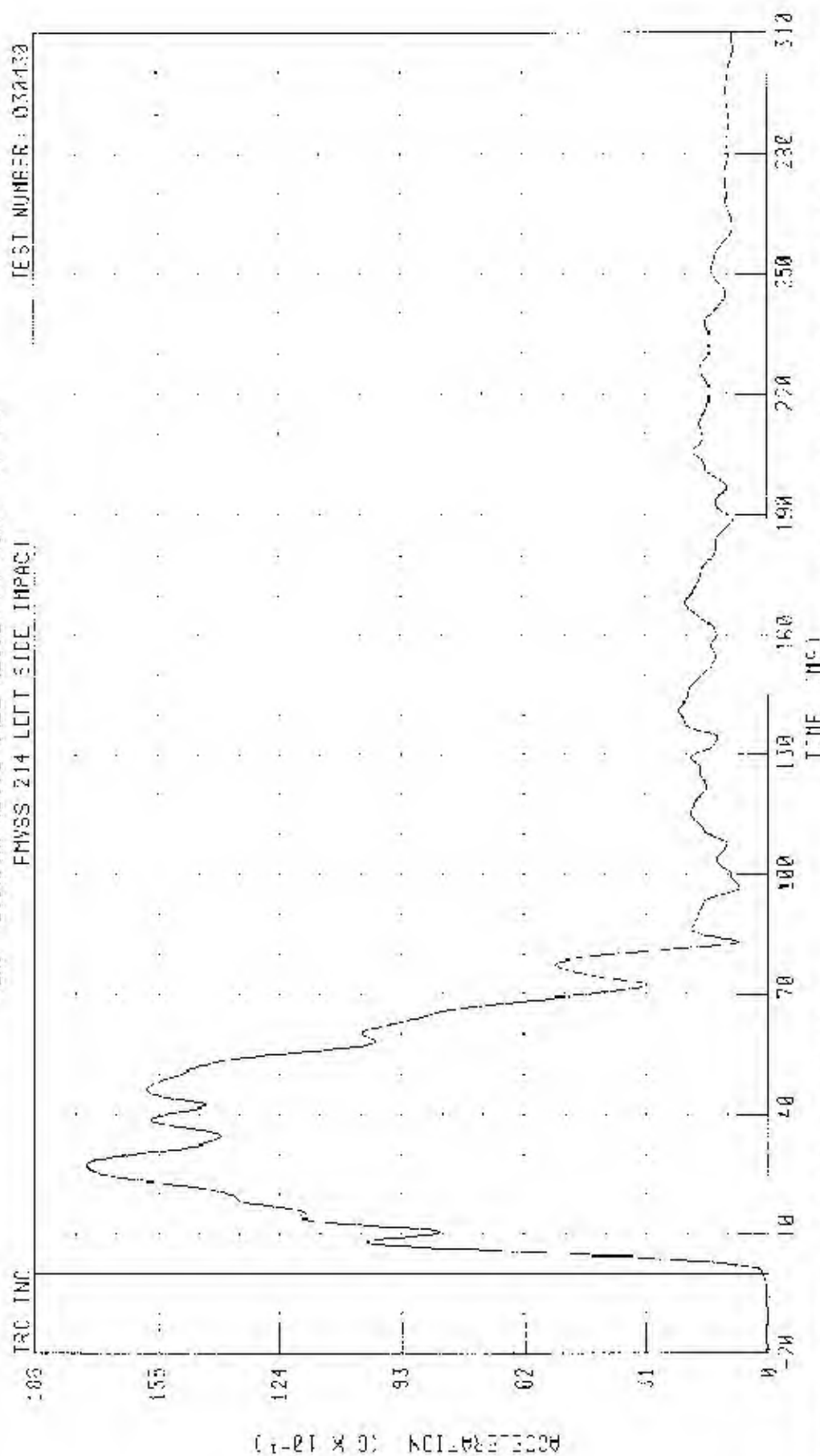
OFFER DATA 1 35 2011 2 50 38 1151 -0 51 48 113 15 92 95

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

RIM: LUBRICAN ABOVE AXLE RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430



CHANNEL 30KRC1 FILTER: CF CLASS: 60

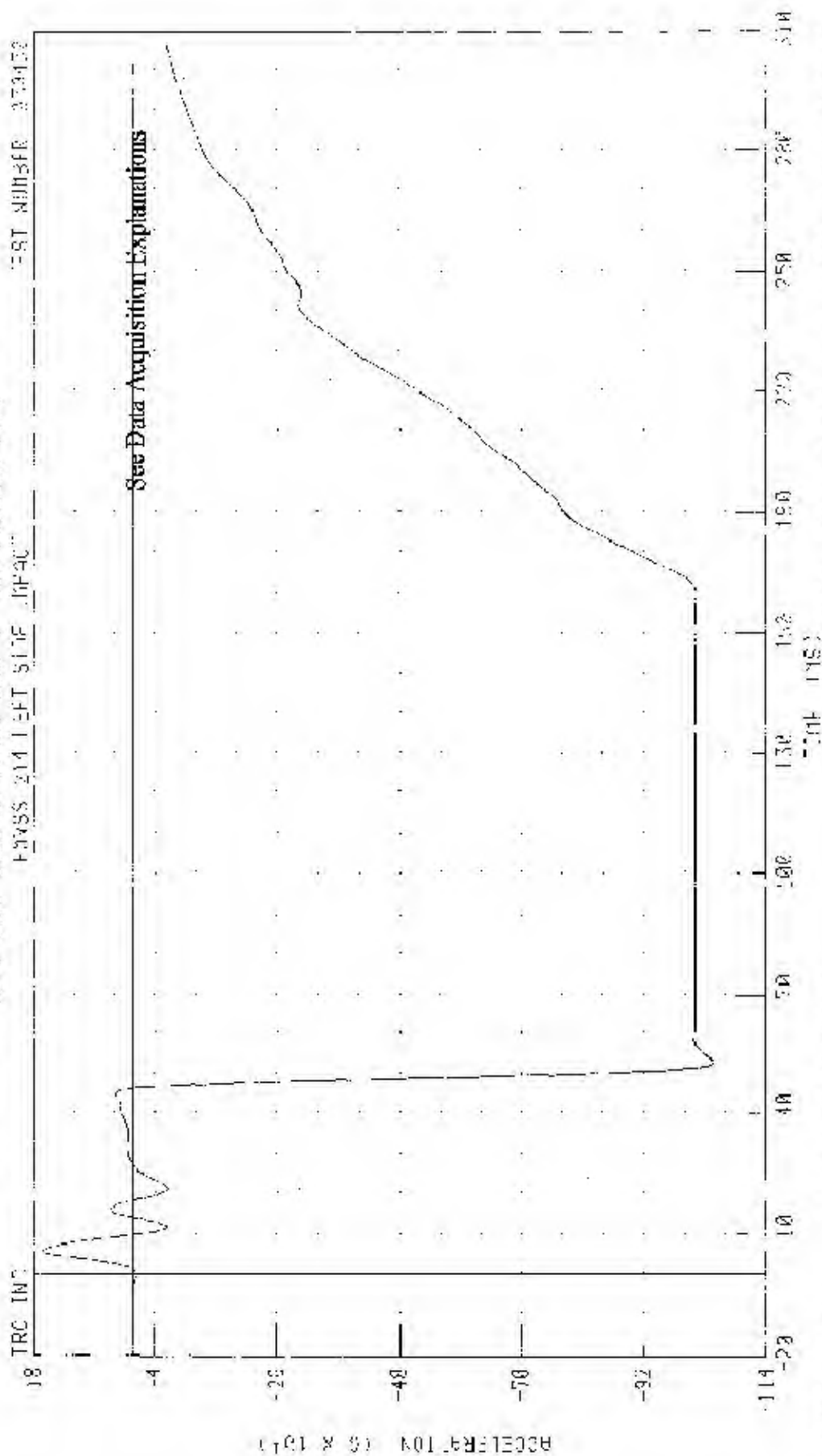
PEAK DATA: 17.32 @ 27.60 MS, 0.43 @ -18.48 MS

1997 AND 2007 - 11 JUL 18 14:40 - 15:00 100 F63 02/55

LEFT SIDE STILL IN FRONT AND NO MORE CUFF-ER, JIG

FWWS 214 LEFT SIDE - RFAC--

TEST NUMBER 379153

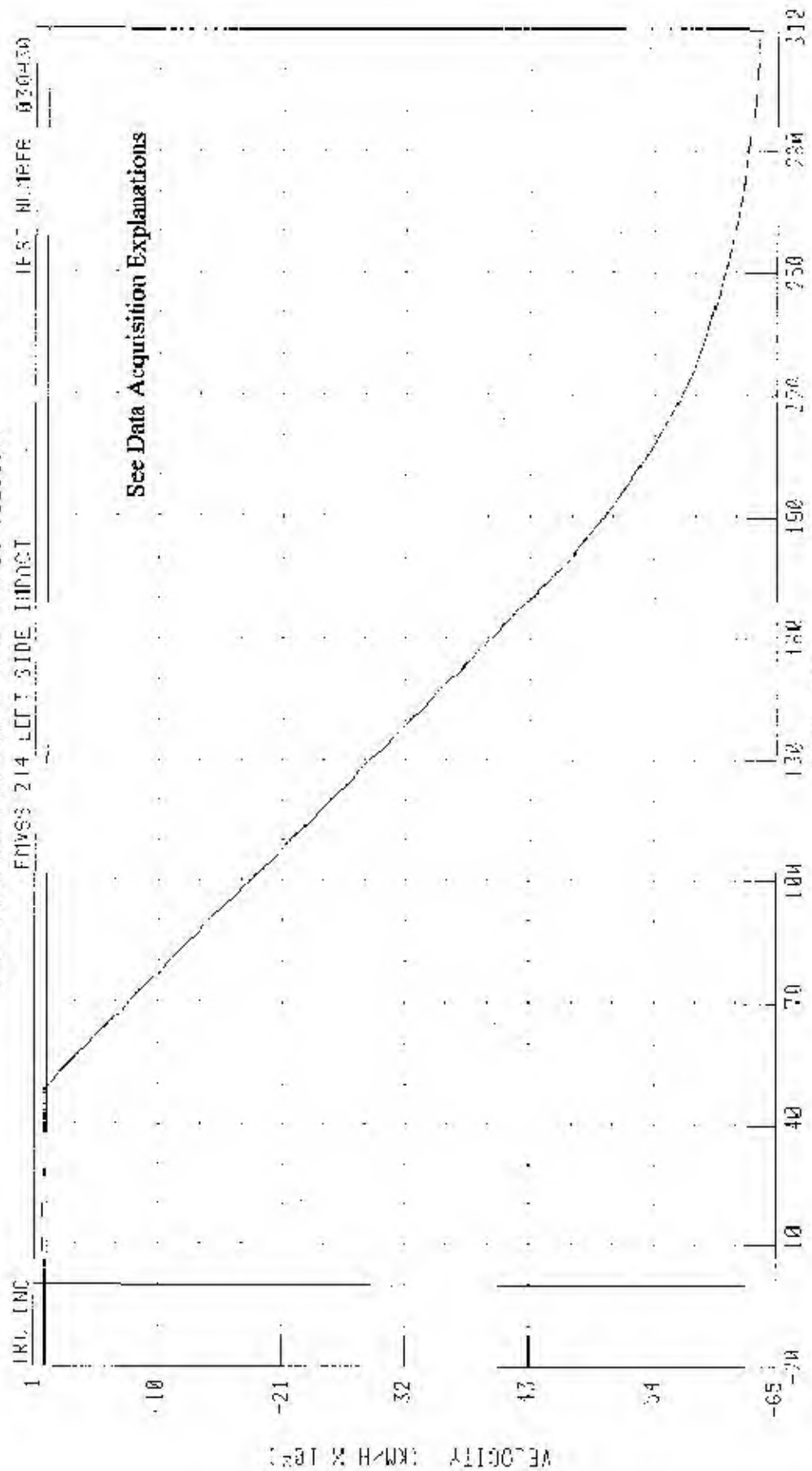


CLASSNAME: FSY31 F1: E2: 01 CLASS: 00

10416 164 29 5 35 13 -1045.35 1.0 22 10 05

55 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIERS) INTO LEFT SIDE OF 2003 BMW 325i

LEFT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY



FILE 0131
 PLT 2014 20 39 CH 4 0 3 75 MS -8340 36 KM/H 0 310 20 110

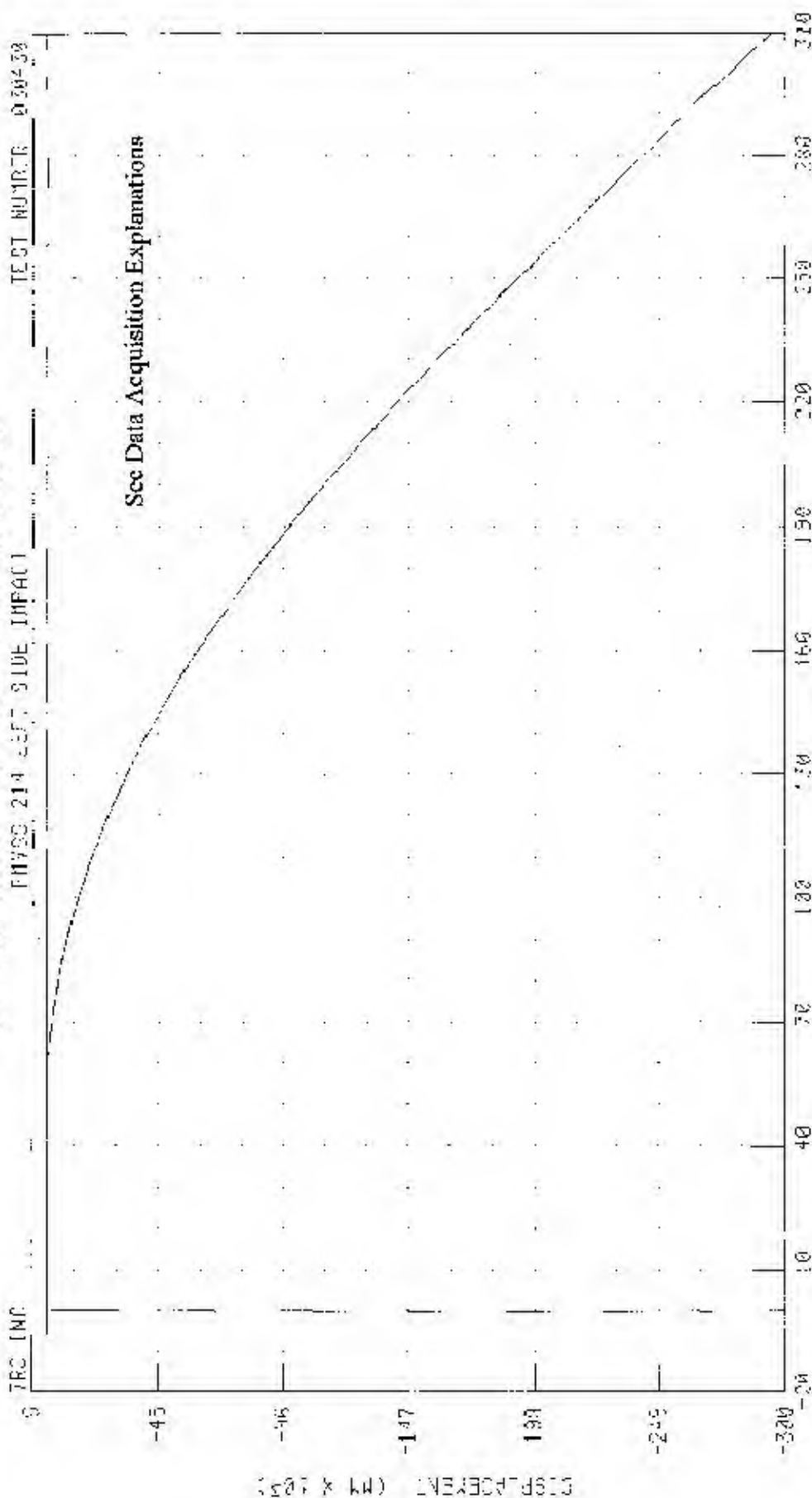
CHANNEL 1 F34V1 FILTER CH CLASS 180

55-23 KPH 90 DEGREE SIDE IMPACT MOVING DETONABLE CARRIER) IND LEFT SIDE 1.27002 RUN 3250

LEFT SIDE SILL AT FRONT SEAT Y-AXIS DISPLACEMENT

PHYSO 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

DATA 230.92 PM 9 49 23 76. -23-757.50 MM @ 710 KPH 115

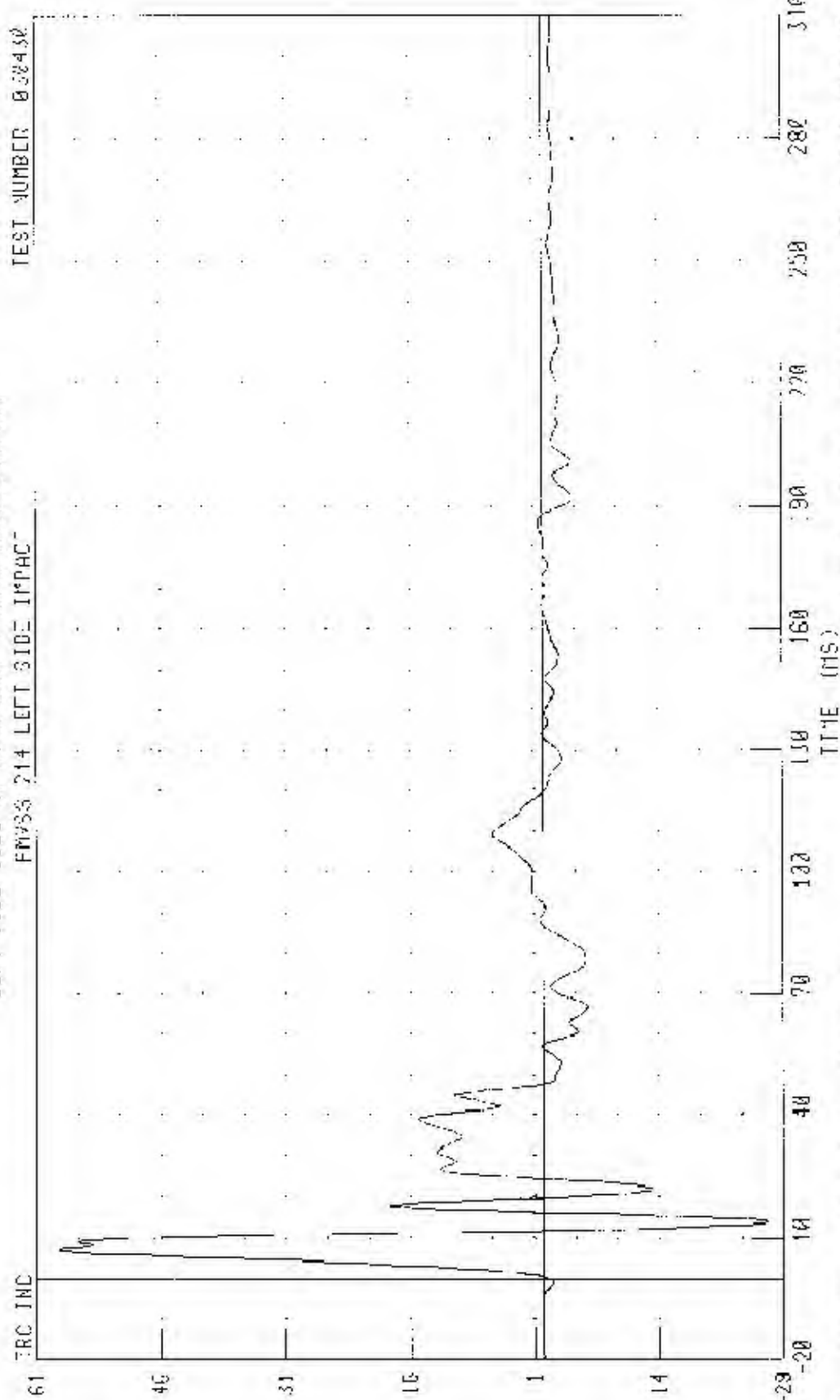
DISPLACEMENT (MM X 103)

55/23 KP-1 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2000 BW 3251

LEFT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



ACCELERATION (G)

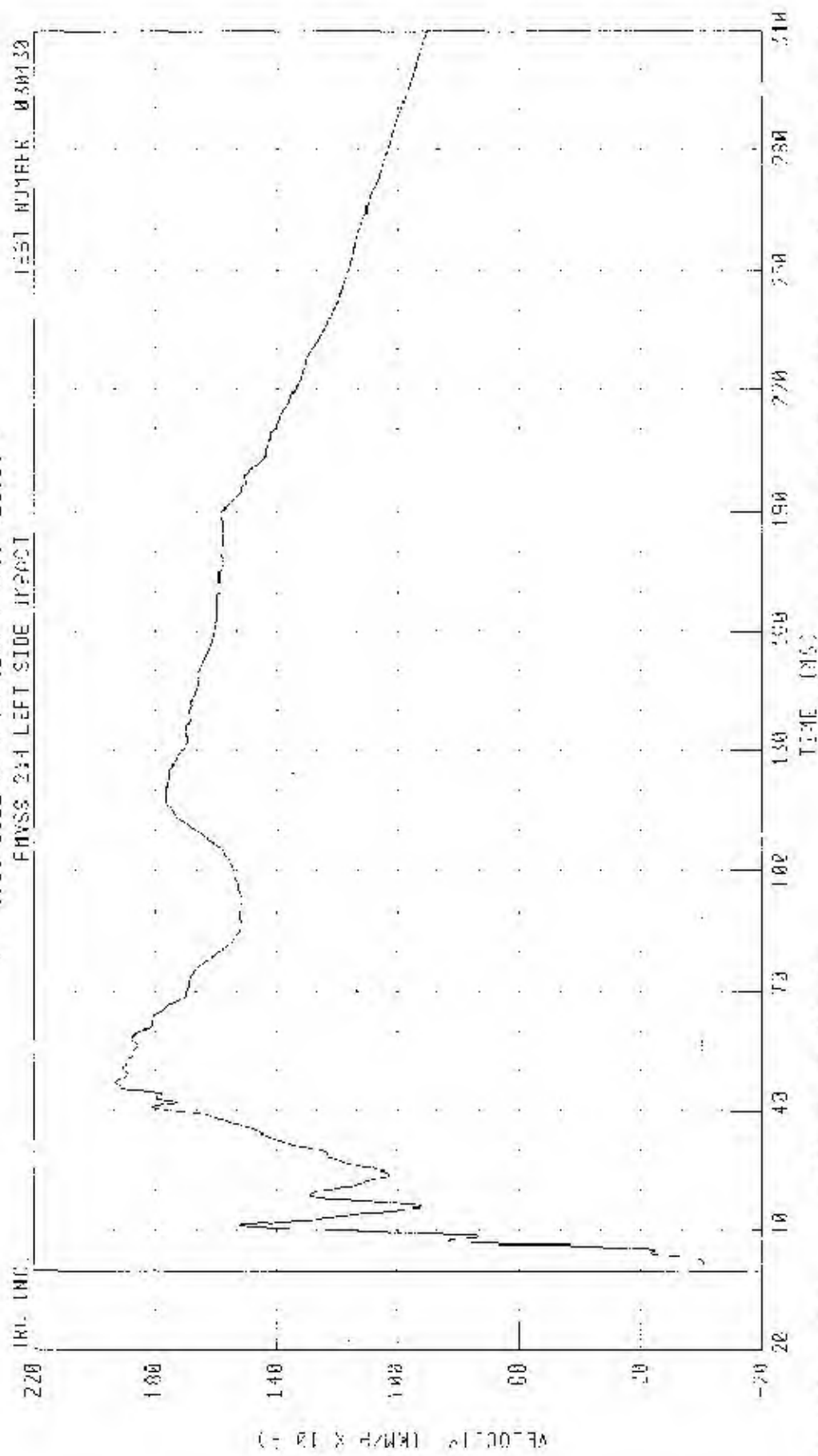
TIME (MS)

CHANNEL 1 RSV61 FILTER C CLASS 50

PEAK DATA 58.55 G @ 6.96 MS 27.17 G @ 13.92 MS

05/28 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRELS) INTO LEFT SIDE OF 2003 DMV 8251

LEFT SIDE STILL AT REAR CRASH AXIS VELOCITY



TEST NUMBER 030430

CHANNEL LRSVVI FILTER 34.0000 180 PEAK TIME 130.00 KPH 180.00 0.00 KPH 18.00 18

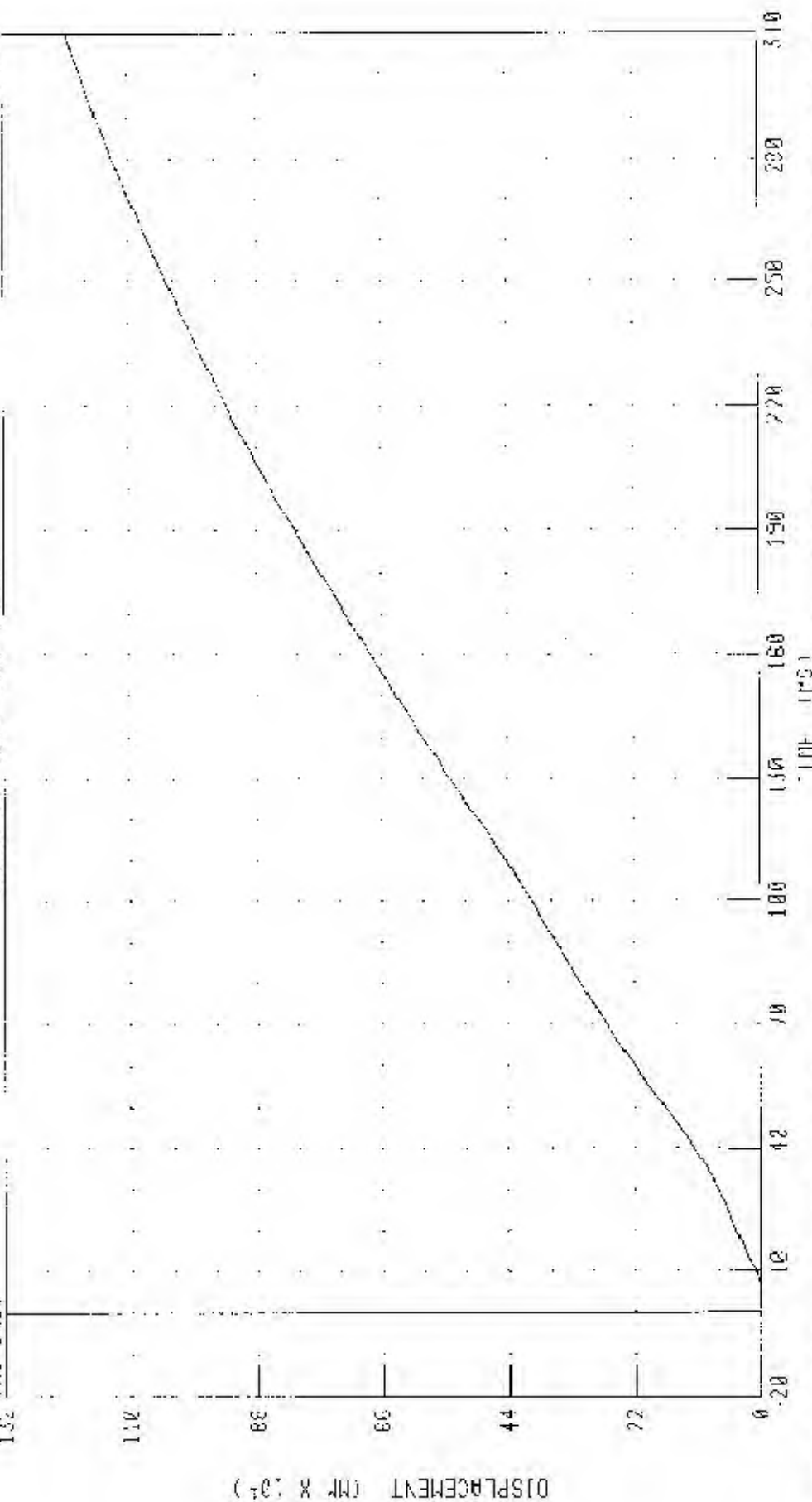
55/28 KPH 34 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

LEFT SIDE SILE AT REAR SEPT Y AXIS DISPLACEMENT

TRC LND

FHVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

CHANNEL LRSYD1 FILTER CH CLASS 104

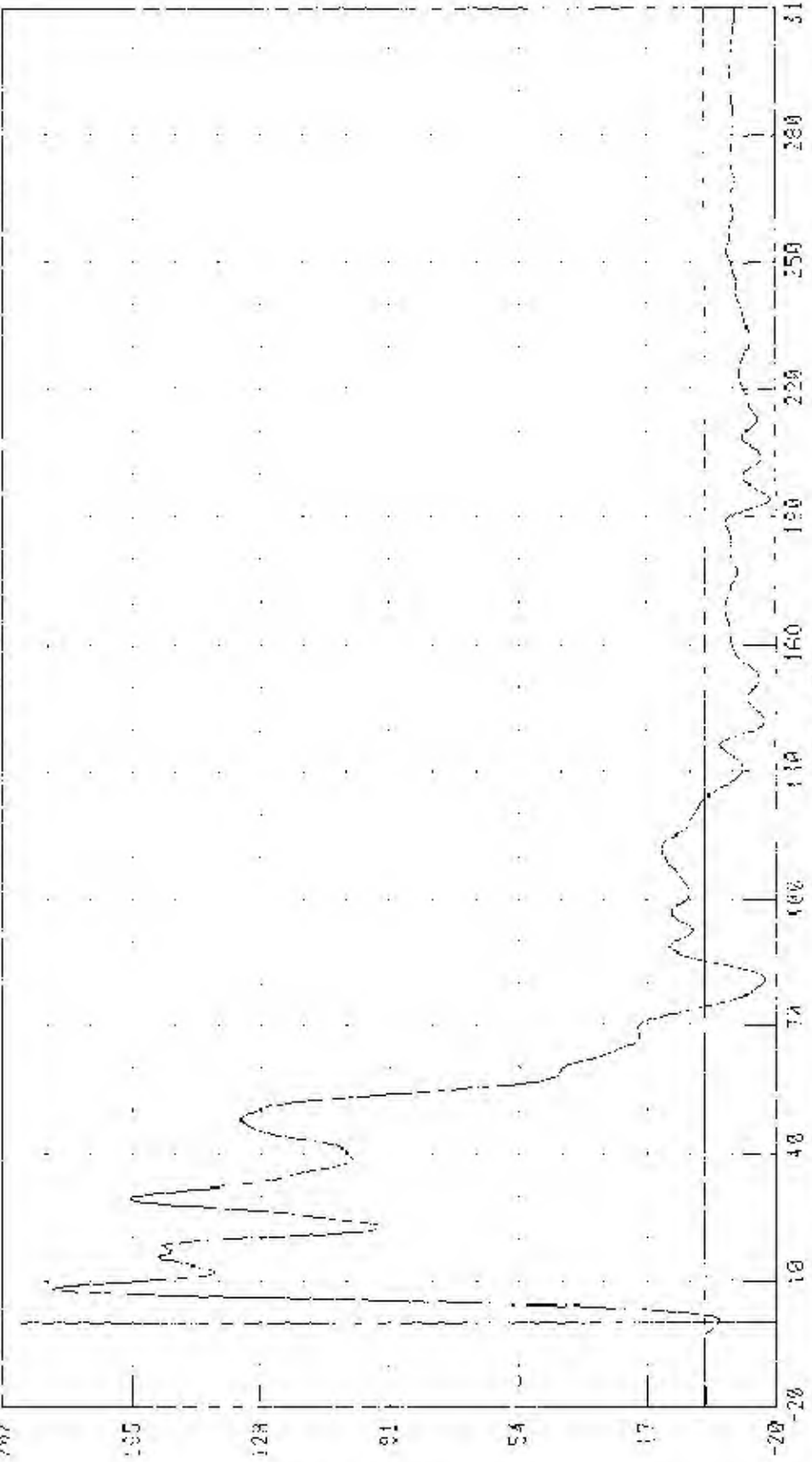
PEAK DATE: 1208 29 MM @ 514 20 10, -0 21 41 0 2 82 13

55/28 62-90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BAY (25)
 RIGHT REAR OCCUPANT COMPARTMENT Y AXIS ACCELERATION

TEST NUMBER: P30430

PHASE 214 LEFT SIDE IMPACT

RC INC



TIME (MS)

CHANNEL BAY 250 FILTER CH CLOSS 60

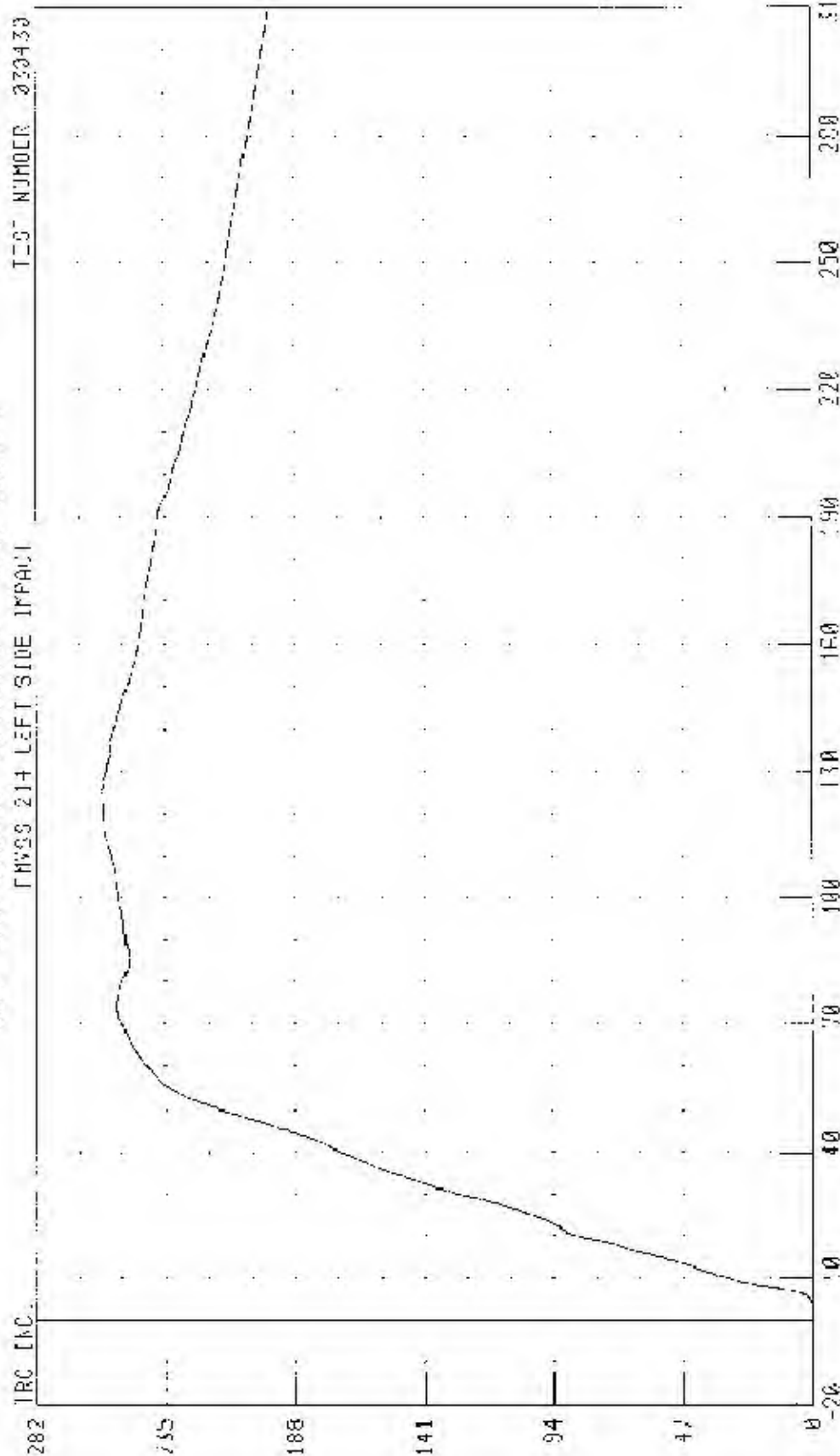
PHASE DATA 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310

55/28 KPH 94 DEFREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 CMV 3251

RIGHT REAR OCCUPANT COMPARTMENT X-AXIS VELOCITY

TCS NUMBER 030430

FWSS 214 LEFT SIDE IMPACT



VELOCITY (KM/H X 10-1)

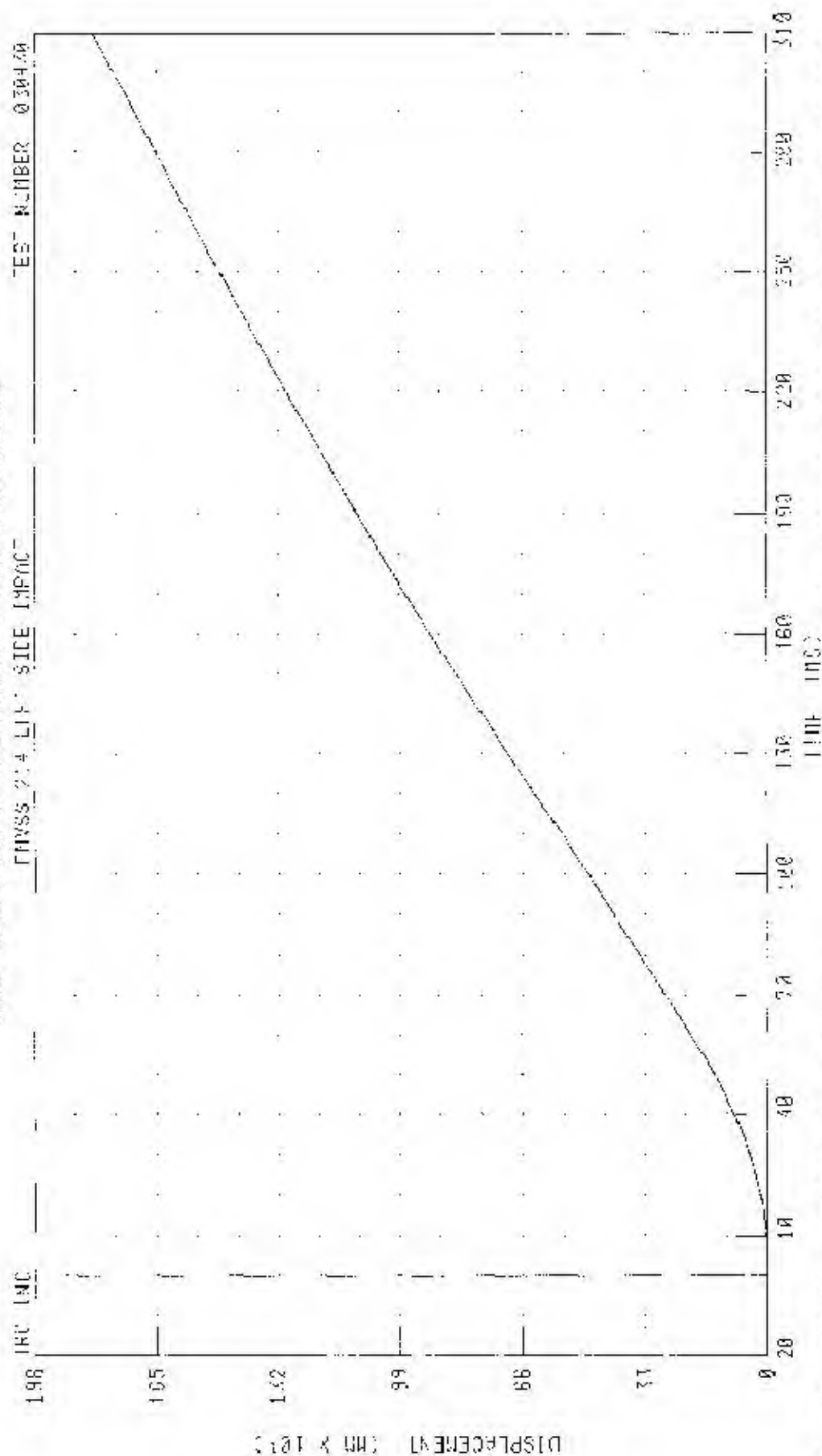
TIME (MS)

CHANNEL: RRTYV1 FILTER: CH1 CLAS5 180

PEAK DATA: 25.81 KM/H @ 124.88 MS, 0.00 KM/H @ 2.00 MS

57178 <PH 911 DEGRF> SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS DISPLACEMENT



TEST NUMBER 030430

PHYS 214 LEFT SIDE IMPACT

CHANNEL 001/01 FILTER OFF, CLASS 100

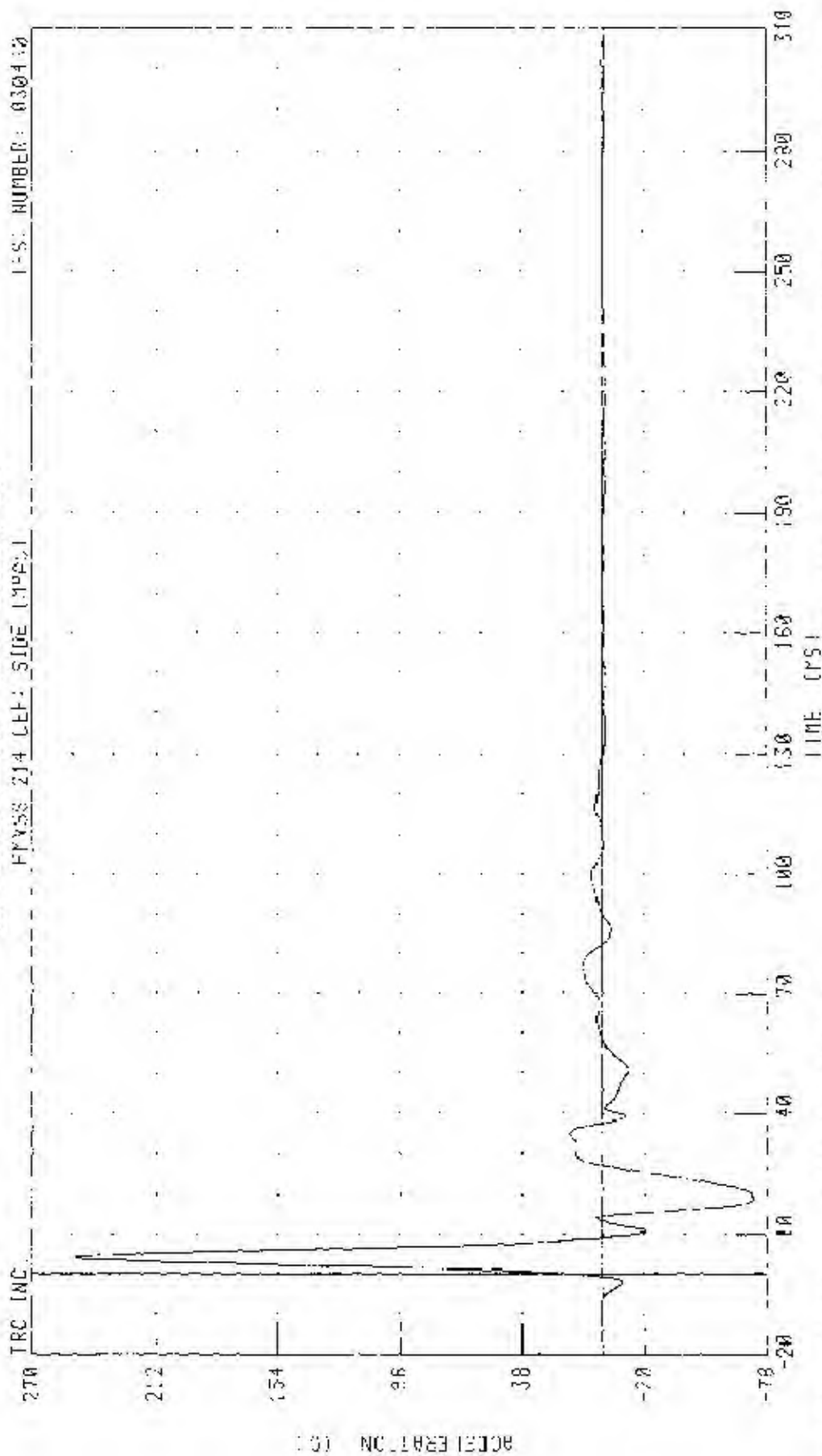
TIME

MS

PERC DATA: 1301 17 110 0 310 00 15.0 00 10' 0 0 00 15

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325I

LEFT LOWER A-POST V-Axis ACCELERATION

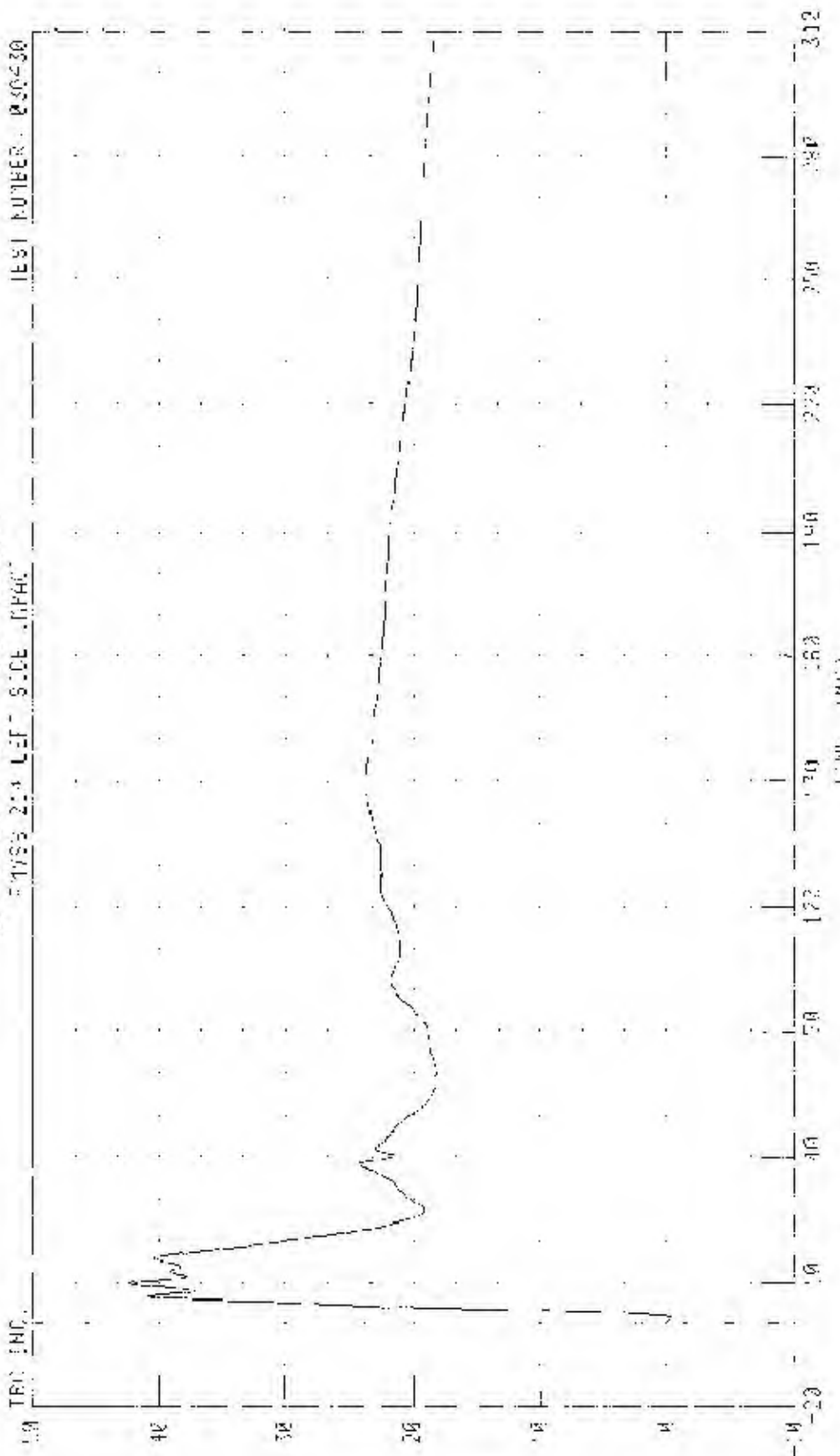


CHANNEL 1 LAYG1 -FILTER CH. CLASS 30

-LAP DATA 249.79 SEC 4.00 MS, -71.50 G 1.0 20 MS

55428 KFH 30 DEGREE SLUE IMPACT (CONVULSION RECORD) LEFT SIDE OF 2004 RPM 325

LEFT LOWER D-POST 7-AXIS VELOCITY



CHANNEL 1 (50V) FILTER OFF CLIPS 130

TIME (MSEC)

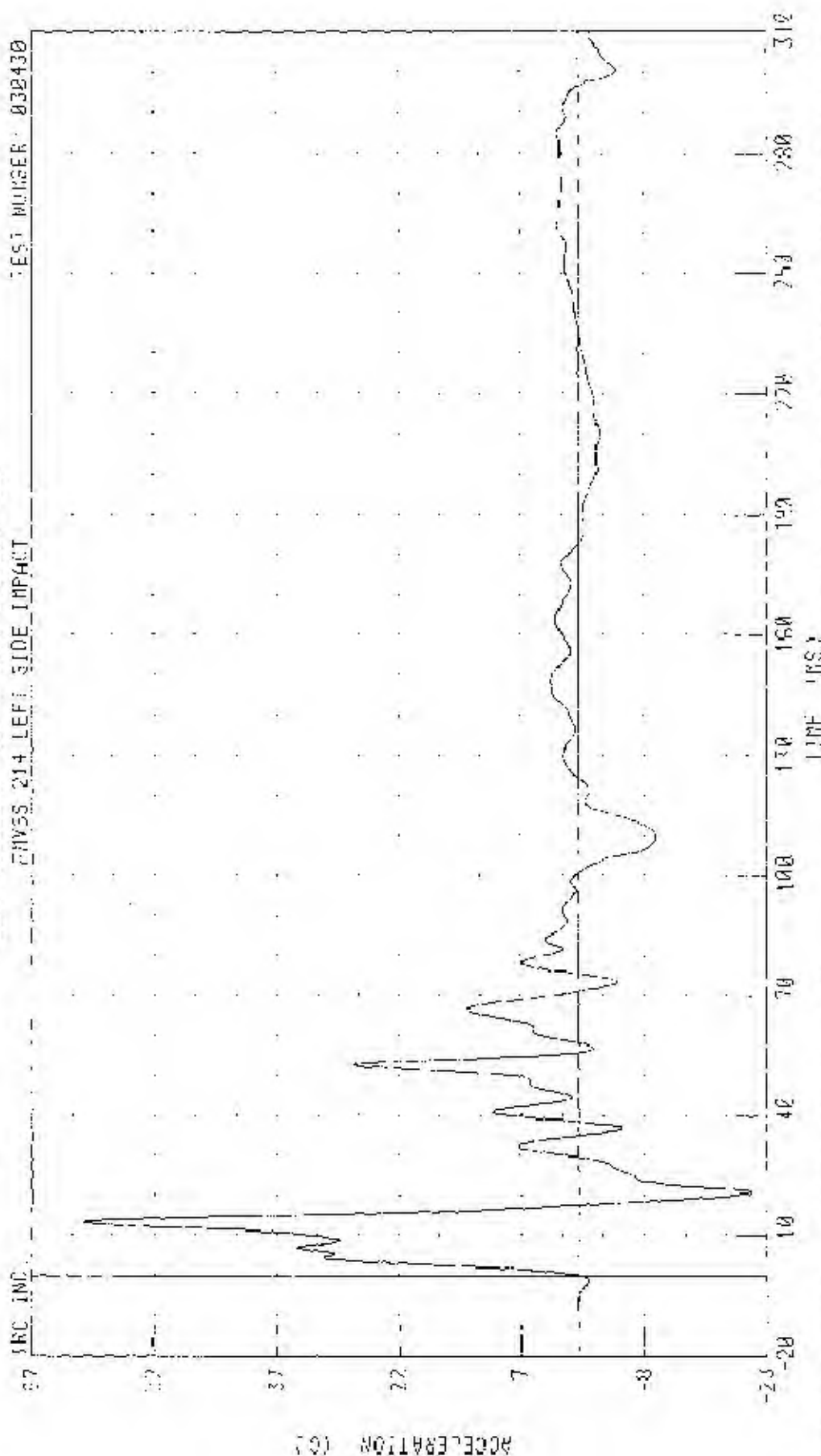
PEAK (400) 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128 130 132 134 136 138 140 142 144 146 148 150 152 154 156 158 160 162 164 166 168 170 172 174 176 178 180 182 184 186 188 190 192 194 196 198 200 202 204 206 208 210 212 214 216 218 220 222 224 226 228 230 232 234 236 238 240 242 244 246 248 250 252 254 256 258 260 262 264 266 268 270 272 274 276 278 280 282 284 286 288 290 292 294 296 298 300 302 304 306 308 310 312

55/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO IHS-7 SIDE OF 2013 BMW 325i

LEFT MIDDLE A-POST Y AXIS ACCELERATION

CHVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL: CHVSS1 FILTER: CHVSS 60

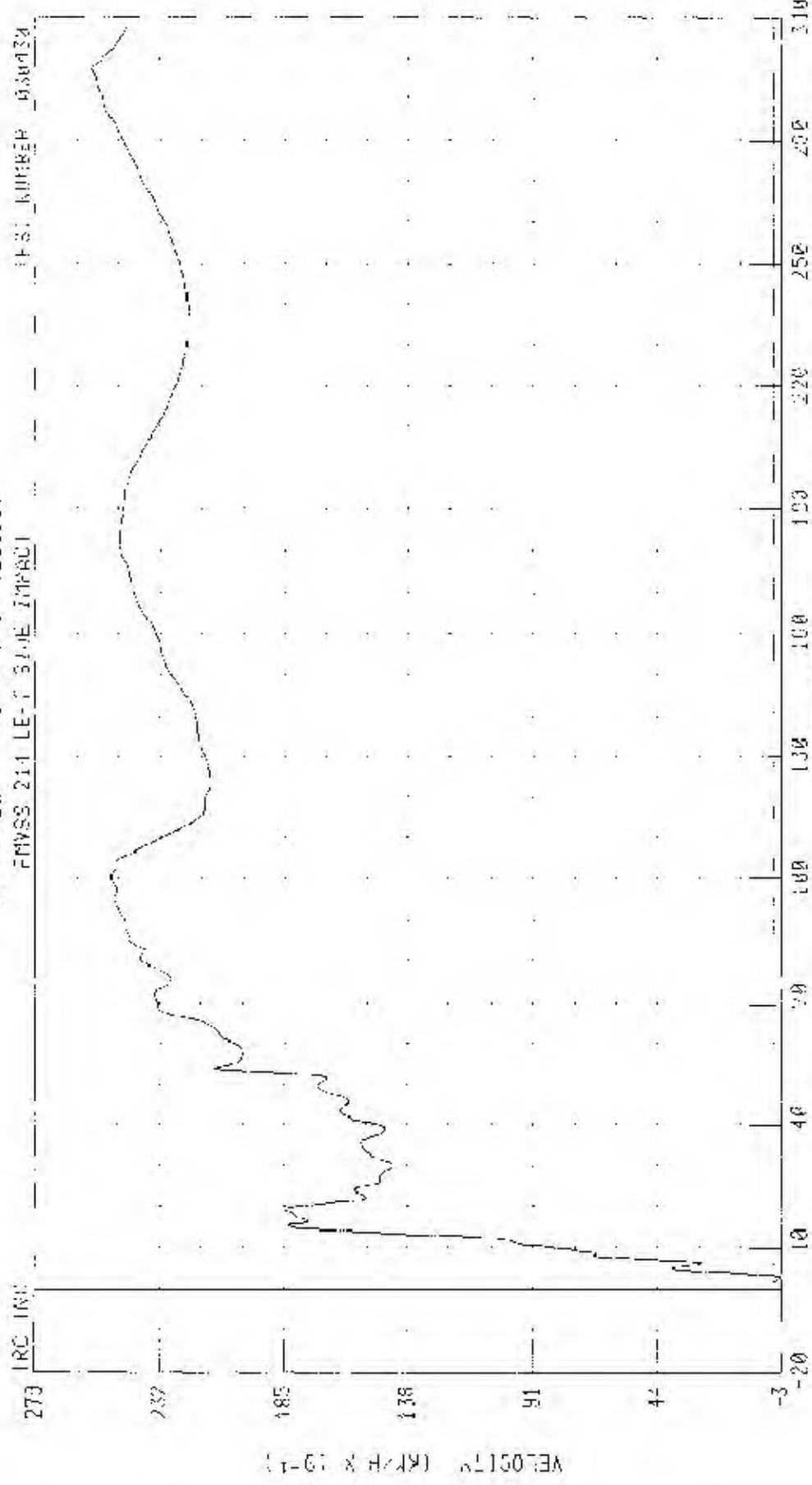
PEAK DATA 60.94 G @ 13.20 MS, 20.23 G @ 22.00 MS

50-28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) IN C-1-F1 XING OF 2003 KRW 3711

FFT HINDLIFT A 3057 V-Axis VELOCITY

PMSS 214 LEFT SIDE IMPACT

FAST KUMBER 030430



TIME (MS)

PEAK 25.75 KPH @ 207.84 MS, -0.27 KPH @ 172.18

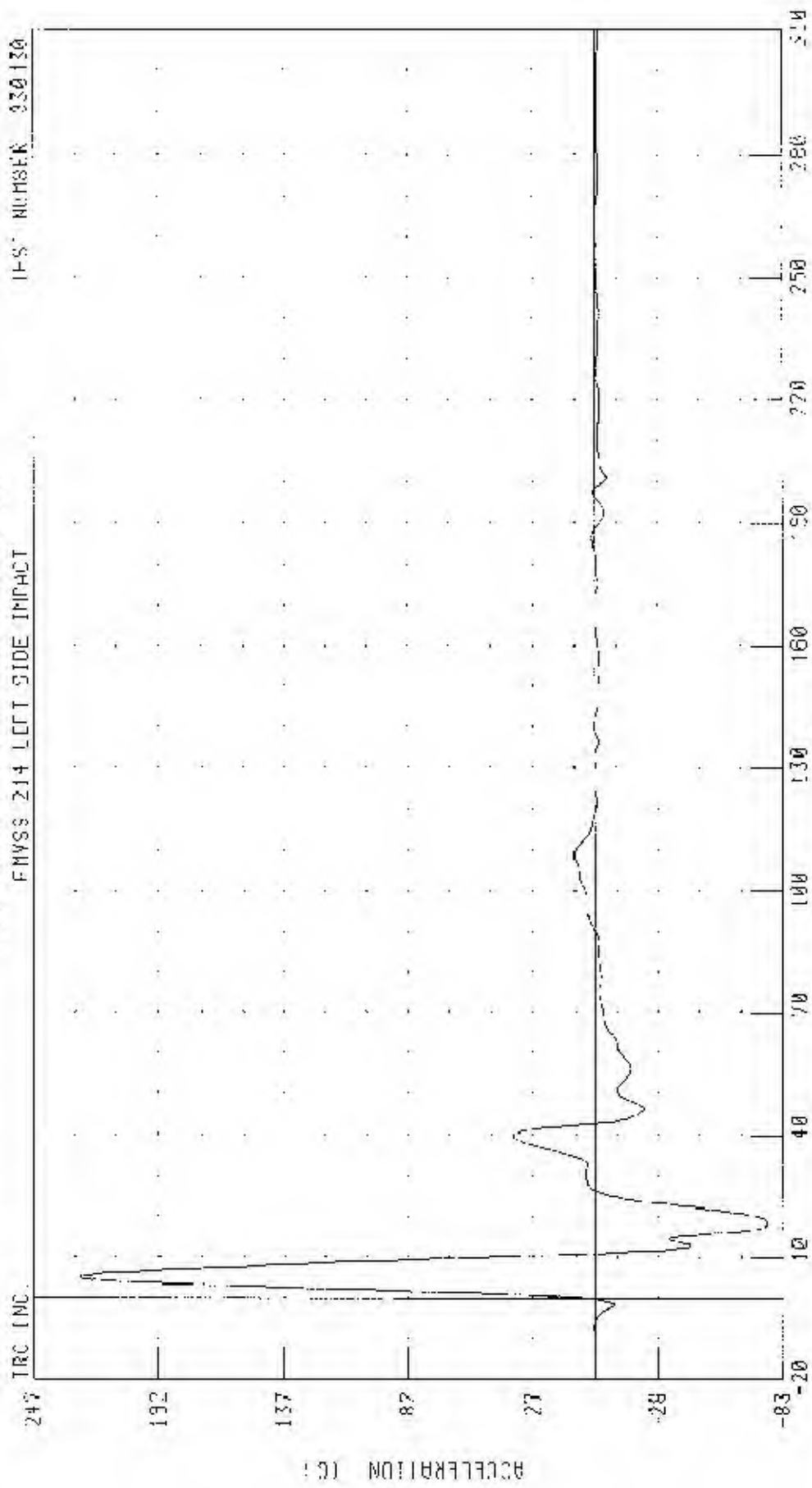
CHANNEL LAMPV: FILTER: Cn. CLASS 100

55/28 KPH 90 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

LEFT IMPACT 3-POST Y-AXIS ACCELERATION

IFS NUMBER 030130

FMVSS 214 LEFT SIDE IMPACT



TIME (MS)

CHANNEL 1 LAY1 FILTER CH CLASS 60

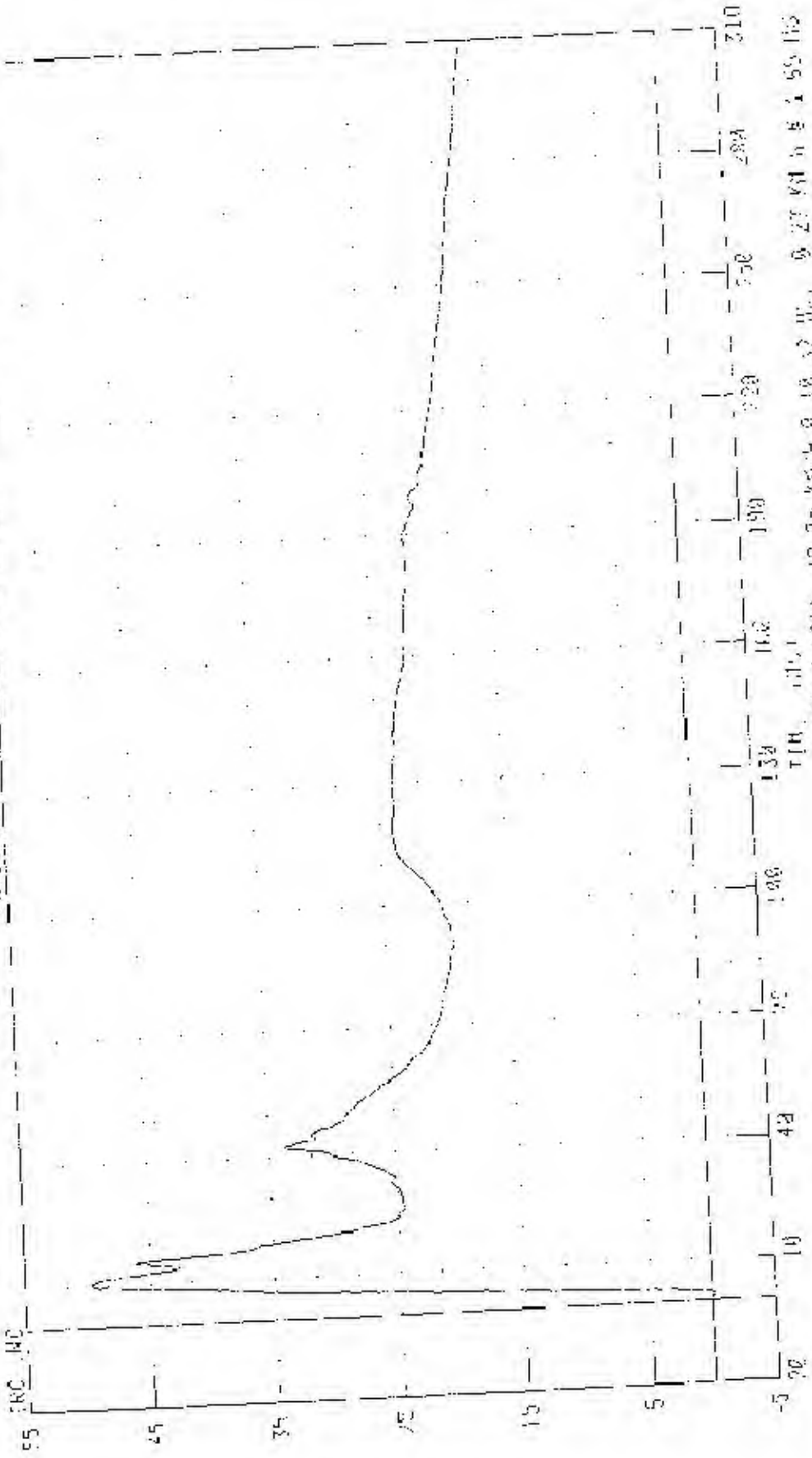
PEAK DATA 220 30 0 5.20 MS -75 64 0 18 80 15

55/28 KPH 90 DEGREE SLIP IMPACT (MOVING DISTURBANCE BARRIER) INTO LEFT SIDE OF 200' BSW 325'

LEFT LOWER B-PUS Y-AXIS VELOCITY

TEST NUMBER: 000130

FIGURE 2-2 LEFT SIDE IMPACT



TIME (SEC) 00 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300 310

CHANNEL 1137V1 FILTER 04 GAIN 100

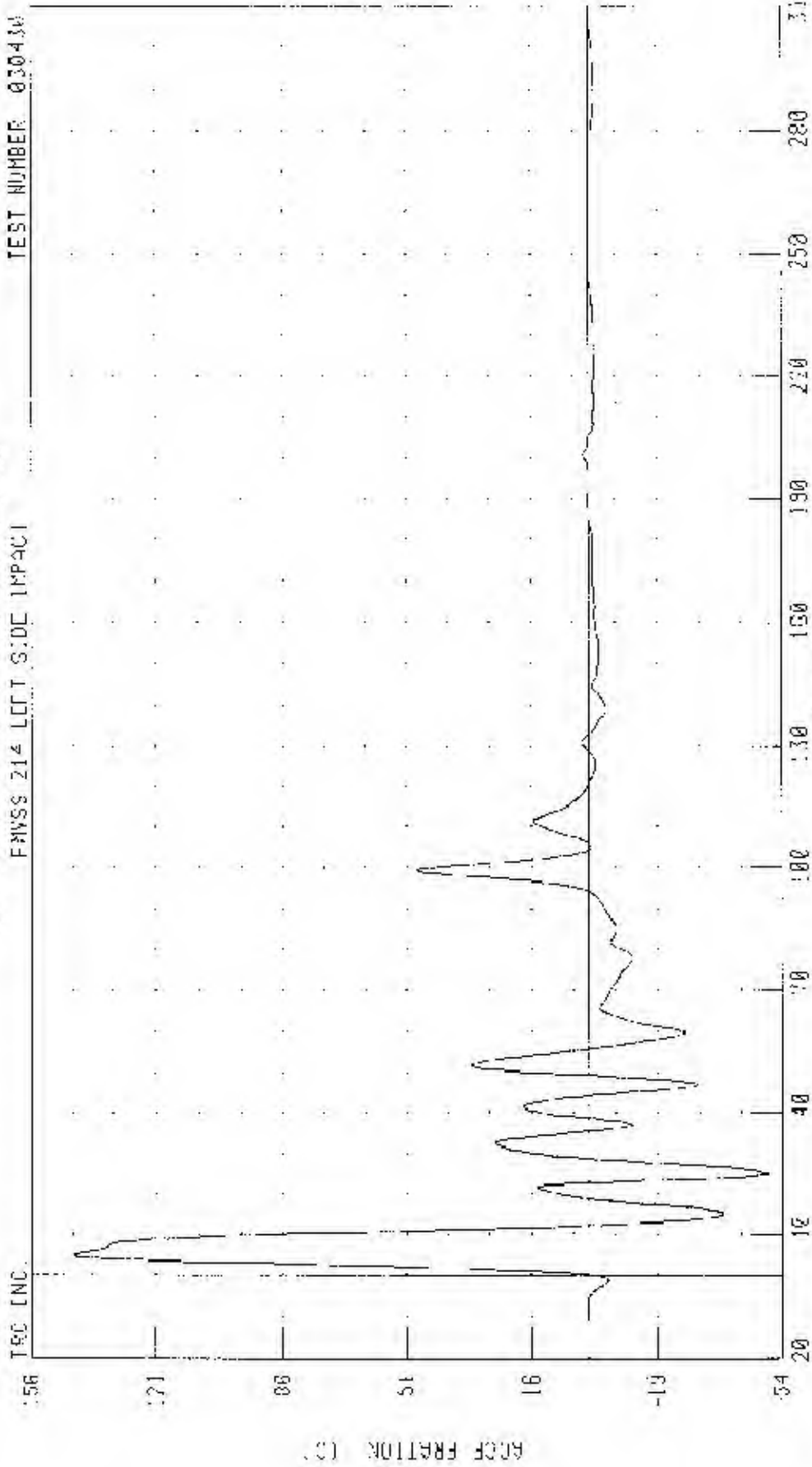
THANKS ATTORNEY

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2203 HWY 3251

LEFT FRONT 3-POST Y-AXIS ACCELERATION

PHYS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL 1 INVC1 FILTER CH CLASS 62

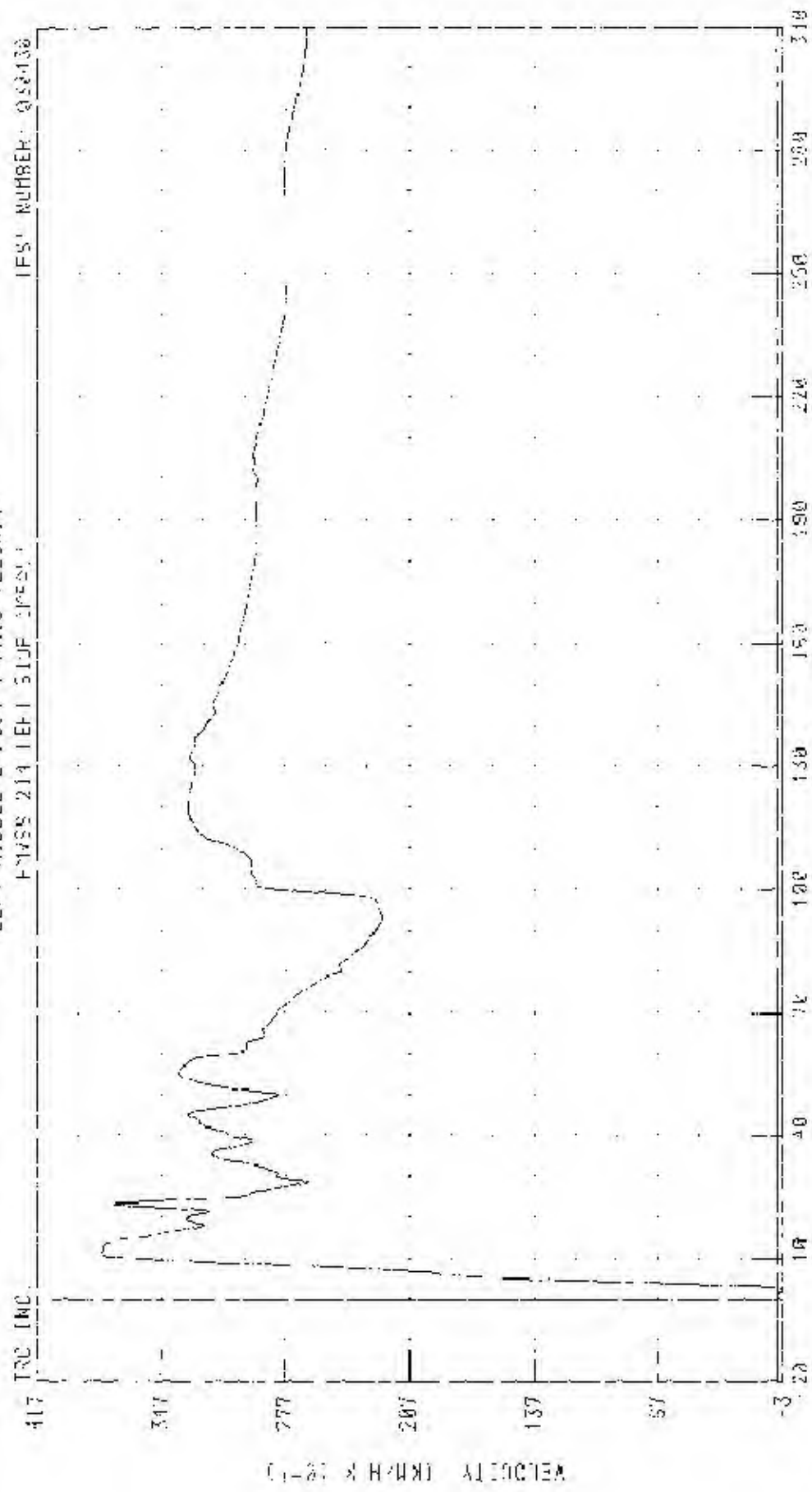
PEAK DATA 143.90 S N E 96.15, -49.60 S E 25.04 10

55/20 KPII 80 DEGREE SIDE IMPACT (MINING DEFORMABLE BARRIER) INTO LEFT SIDE OF 209.3 GAW 3251

LEFT MIDDLE B-POST Y-AXIS VELOCITY

PHASE 214 LEFT SIDE SPEED

IFS NUMBER 052430



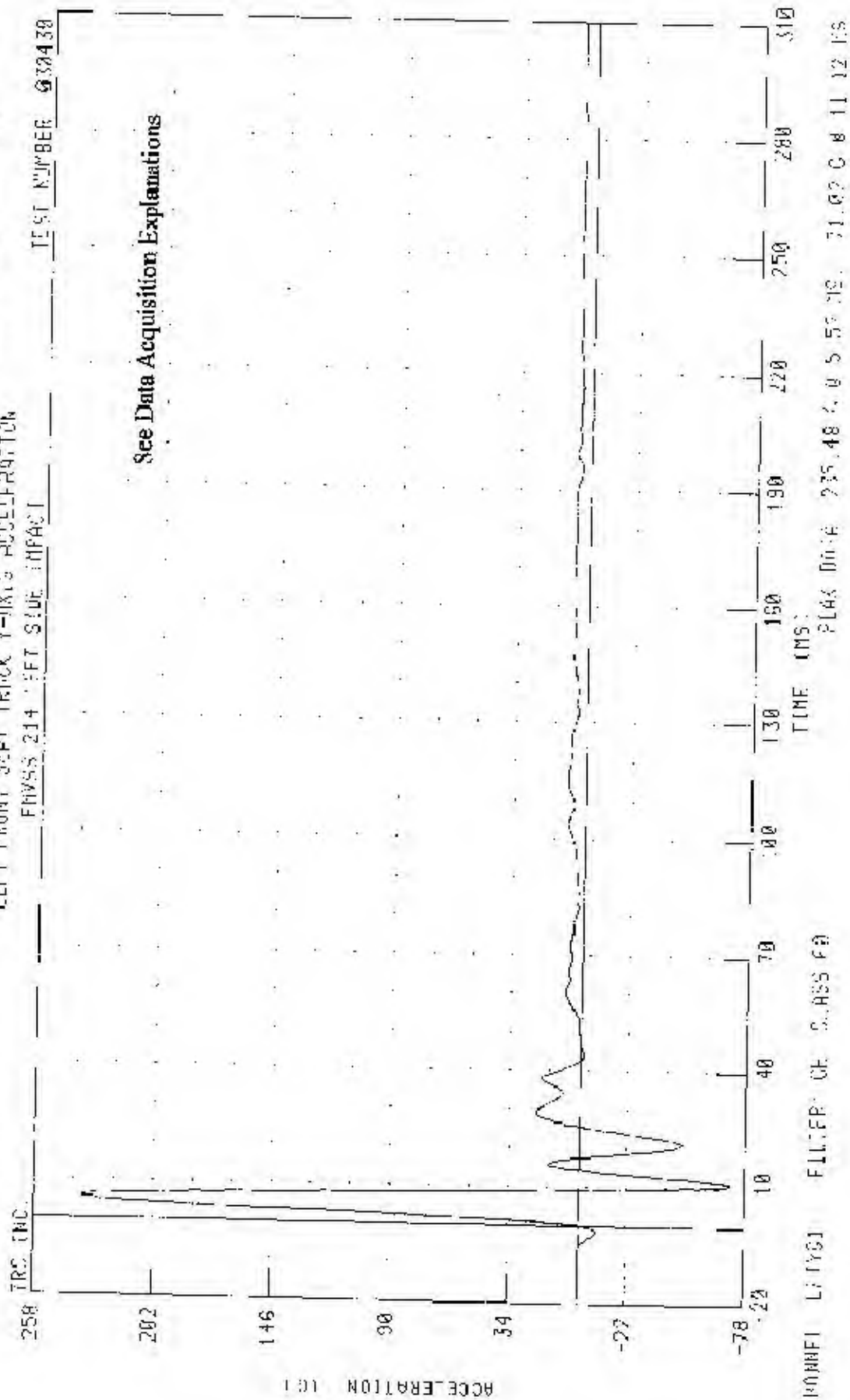
TYPE (MS)

PEAK DATA 36.83 KPH 3.11 17 MS, -0.34 KPH 0.2 10 MS

FILTER ON CLOSE 100

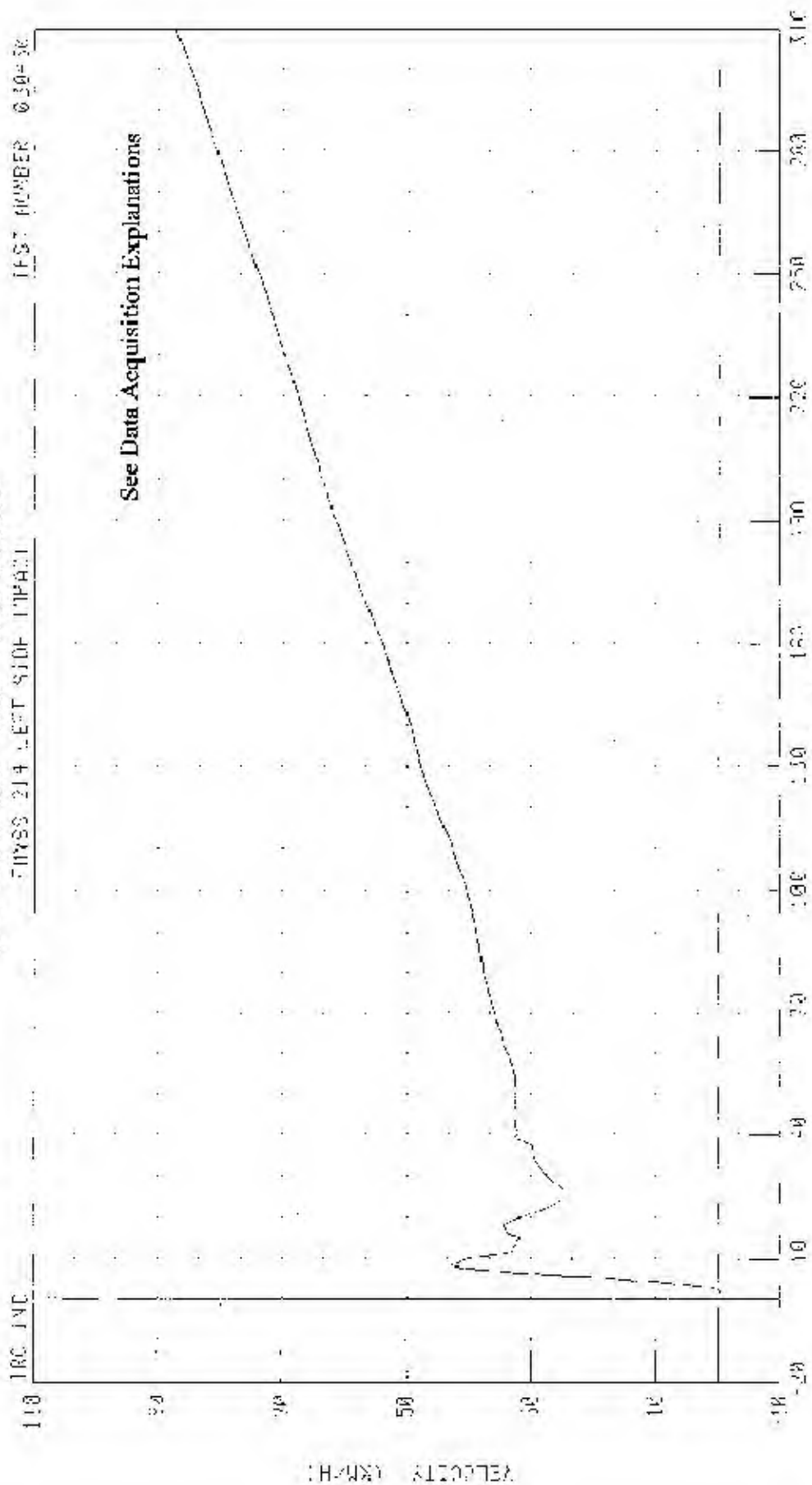
CHANNEL LTRVI

55/20 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 200.5 RMW 525;
LEFT FRONT SEPT TRACK Y-OXIS ACCELERATION



55/28 275 90 DEGREES SIDE IMPACT /MOVING OFFROADABLE BARRIER/ INTO LEFT SIDE OF 2002 B/W 325

LEFT FRONT SCOT TRACK Y AXIS VELOCITY



CH001F L-1191 FILTER CH CLASS 18d

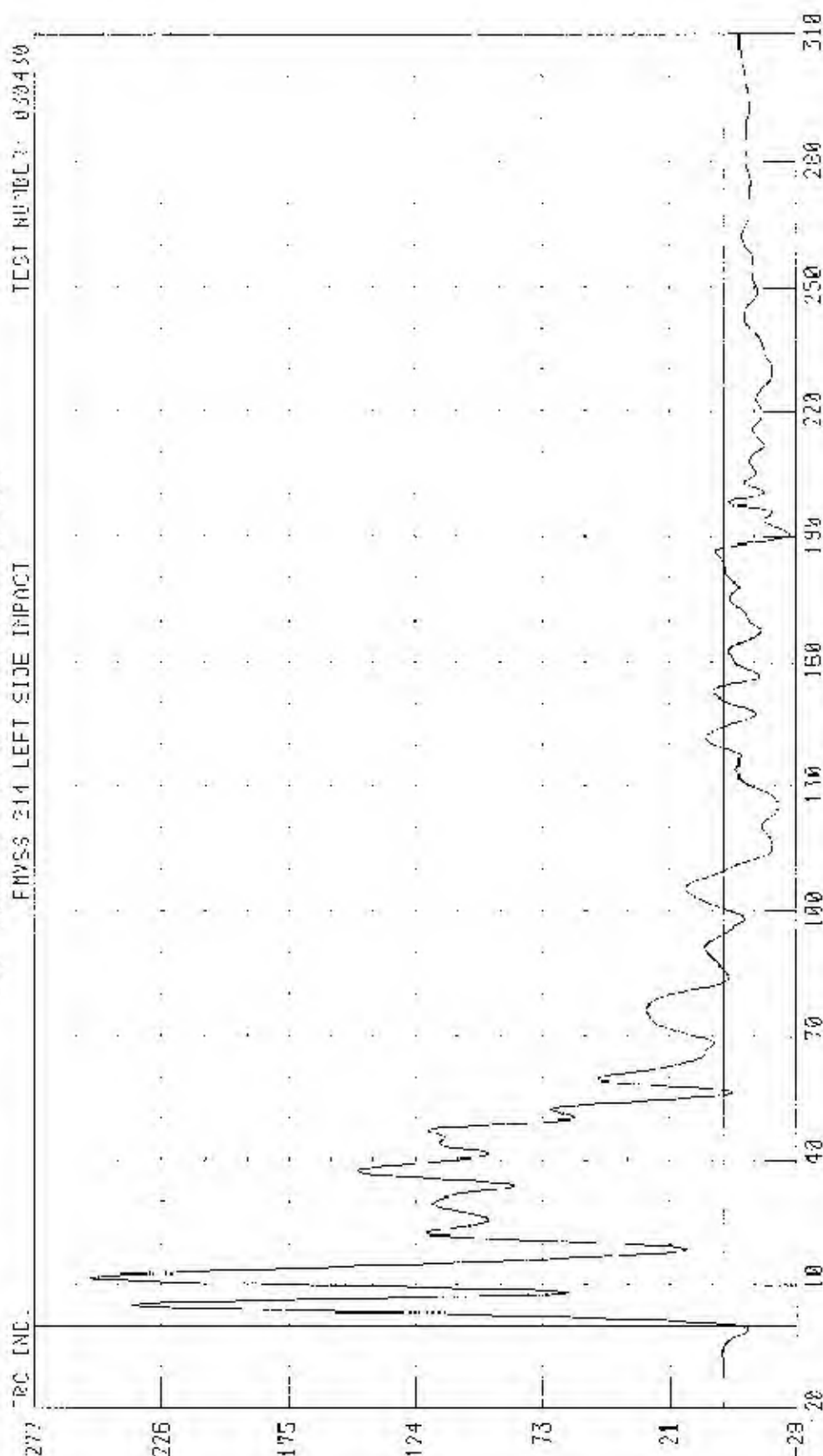
FFWD DATA 97 12 K1 12 310.00 15, 0 10 K1 12 310 15

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING OFFROADABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

LEFT REAR SEPT BACK Y-AXIS ACCELERATION

TEST NUMBER: 030430

FMVSS 214 LEFT SIDE IMPACT



TIME (MS)

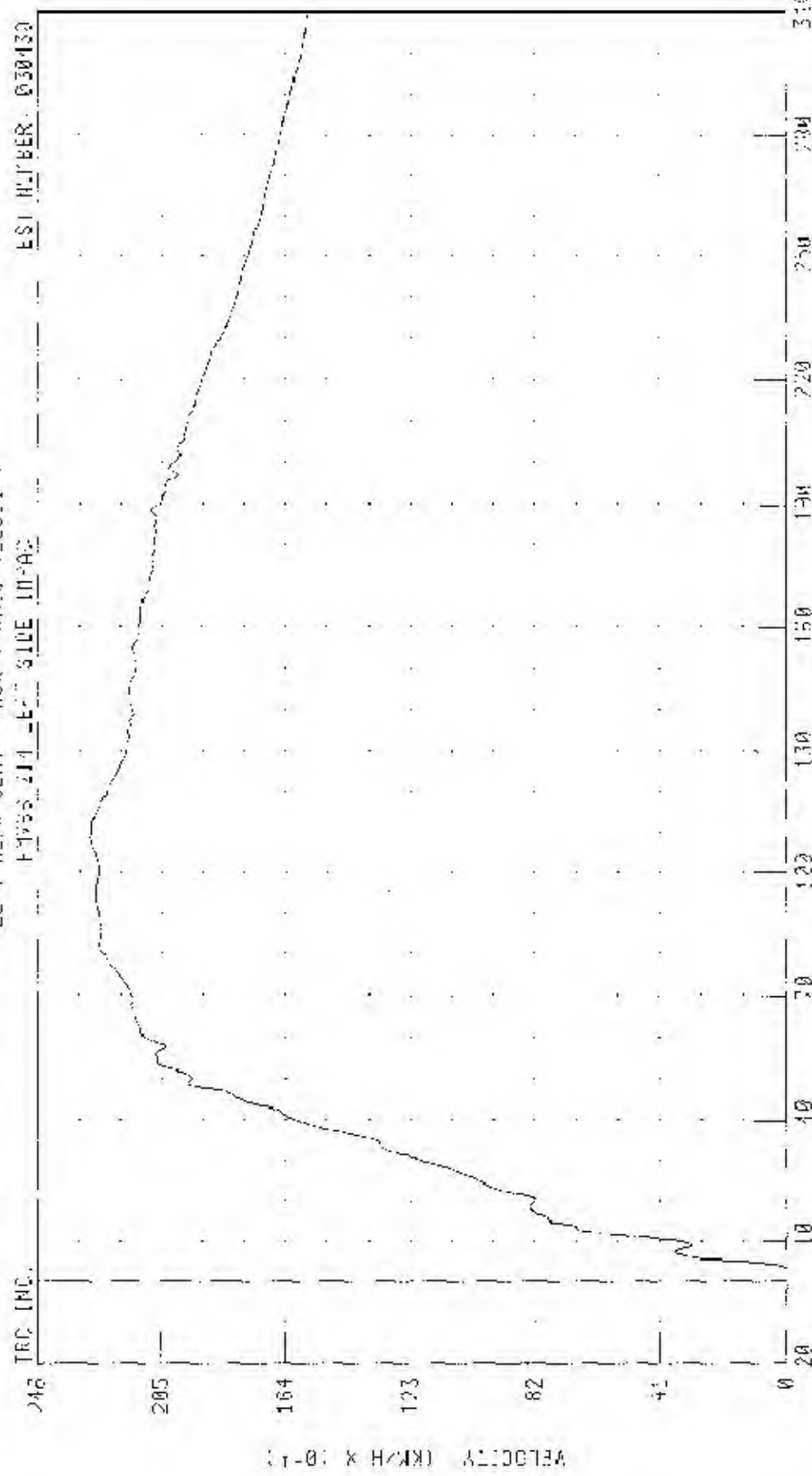
CHANNEL: LRTVC1 FILTER: CH 0.055 60

PEAK DATA 25.44 3.0 11.73 15. 2.70 0.0 100.48 15

55/28 WPT 90 DEGREE SIDE IMPACT (MOVING SECURABLE BARRIER) TEST SITE OF 2004 RPA 3074

LEFT REAR SCOT TRACK Y-AXIS VELOCITY

TEST NUMBER: 030430



TIME (MS)

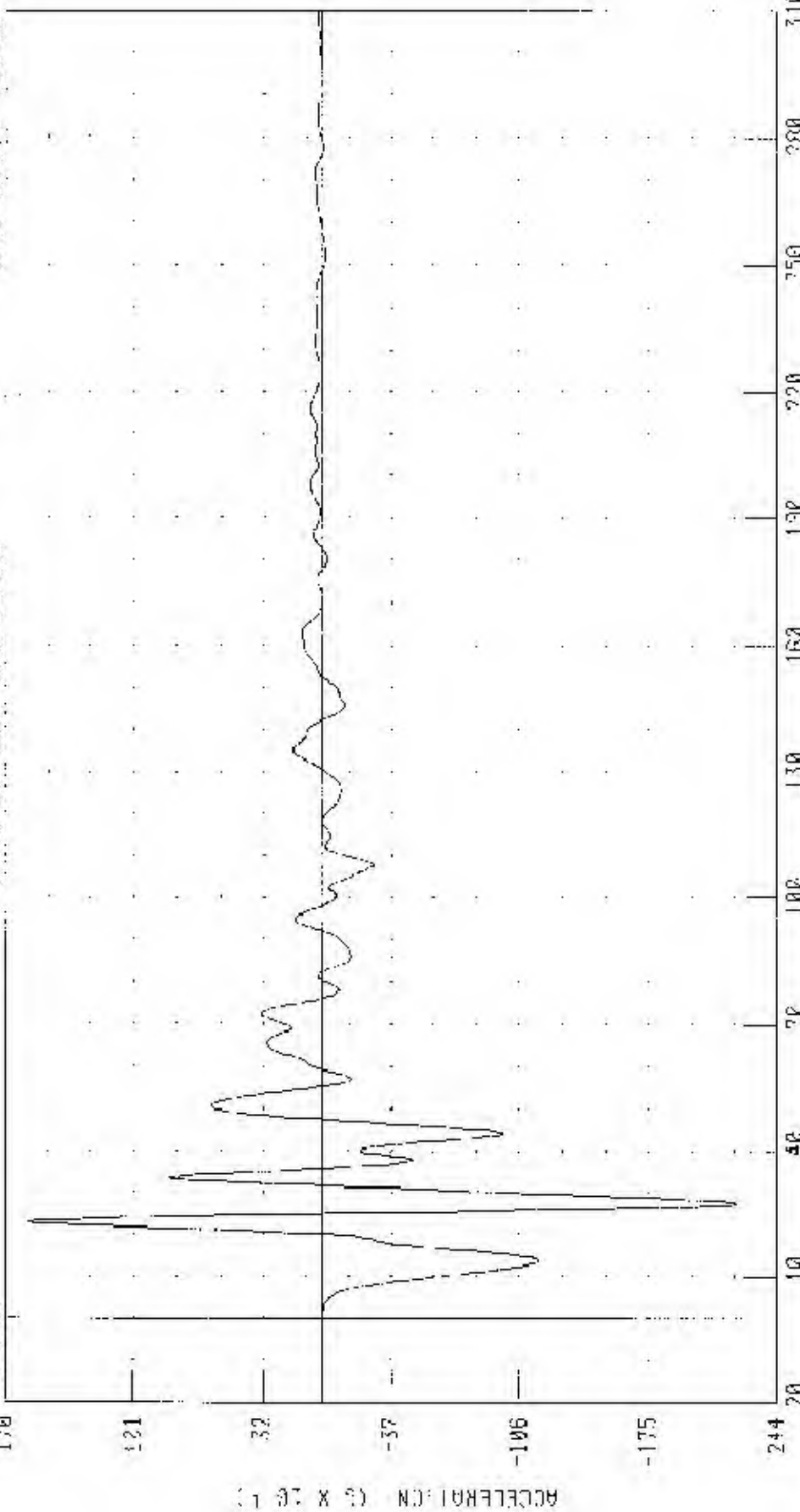
CHANNEL 127V1 FILTER 3H CLASS 100 PEAK DATA: 27.36 AMP @ 100 TO 100 -0.03 K/M @ 2.35 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER: 030430

RC INC.



CHANNEL: VCCXG1 FILTER: LF CLASS: 63

TIME (MS)

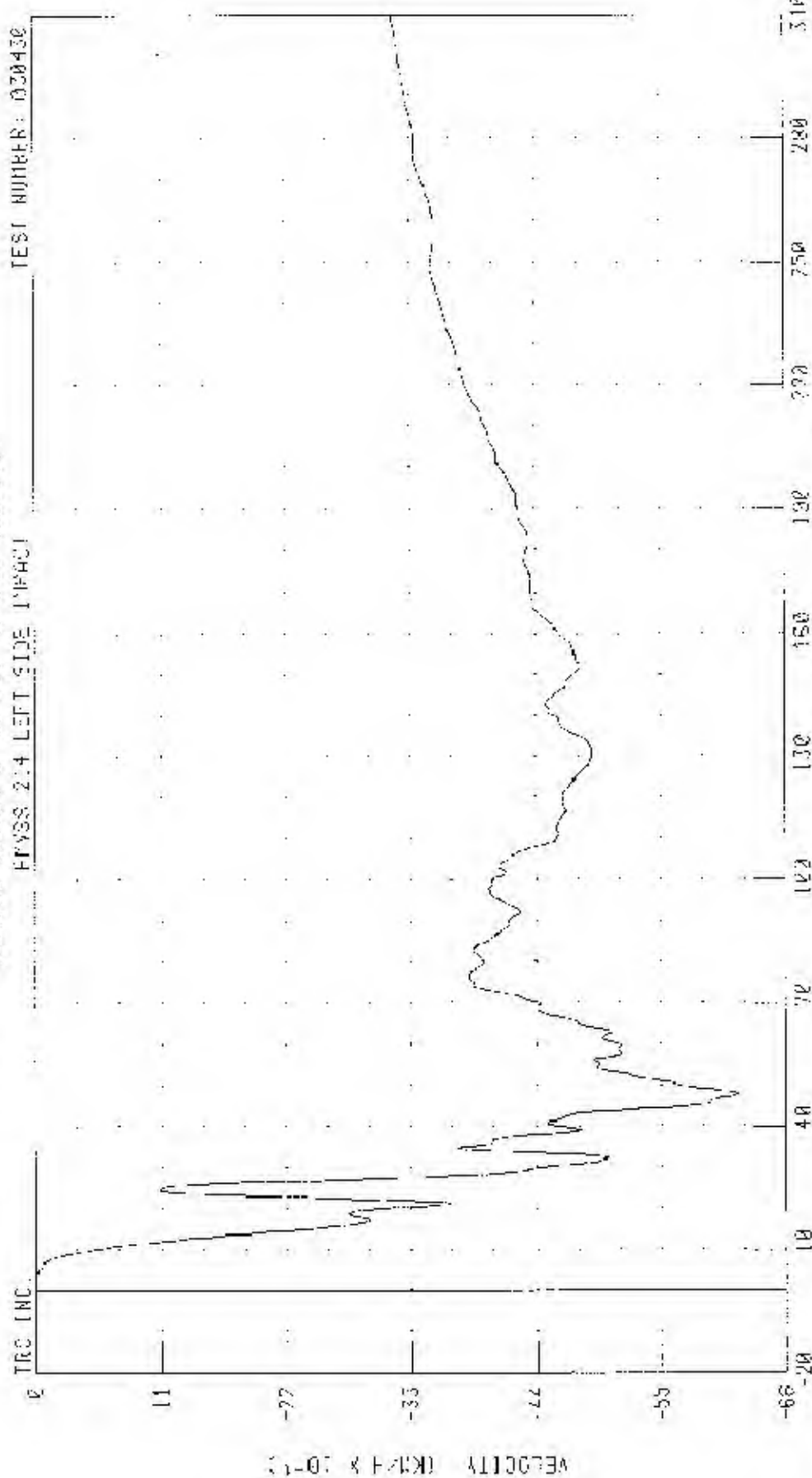
PLK DATE: 15 03 06 22 72 15 -22 27 0 27 16 11

30-28 KP4 90 DEGREE SIDE IMPACT (MOVING AFFORDABLE BARRIER) INTO LEFT SIDE OF ROAD B/W 3251

VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

TEST NUMBER: 030430

FRYSS 214 LEFT SIDE IMPACT



VELOCITY (KM/H X 10⁻¹)

TIME (MS)

CHANNEL VCGXV1 PL 1F2 CH CLASS 130

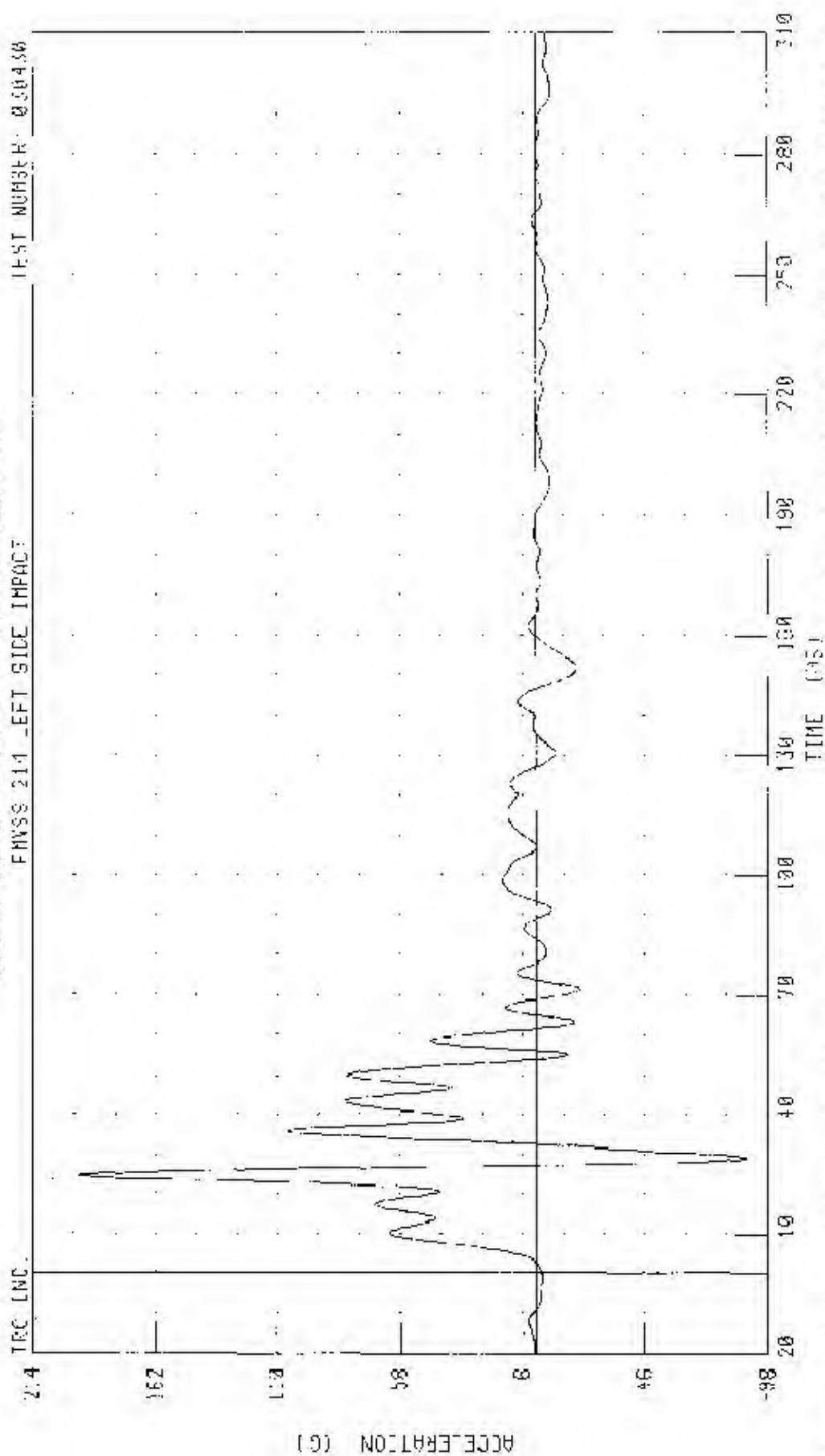
PEAK DATA 0 00 00.4 0 2.00 MS, C 17 KP-H 0 47 92 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

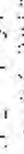
TEST NUMBER: 050430



CHANNEL: VCCY01 FILM: CH CLASS: 03

PEAK DATA: 100 84 3 8 24 64 15, -89 43 6 0 29 20 25

VEHICLE IDENTIFICATION TAGS: VELOCITY



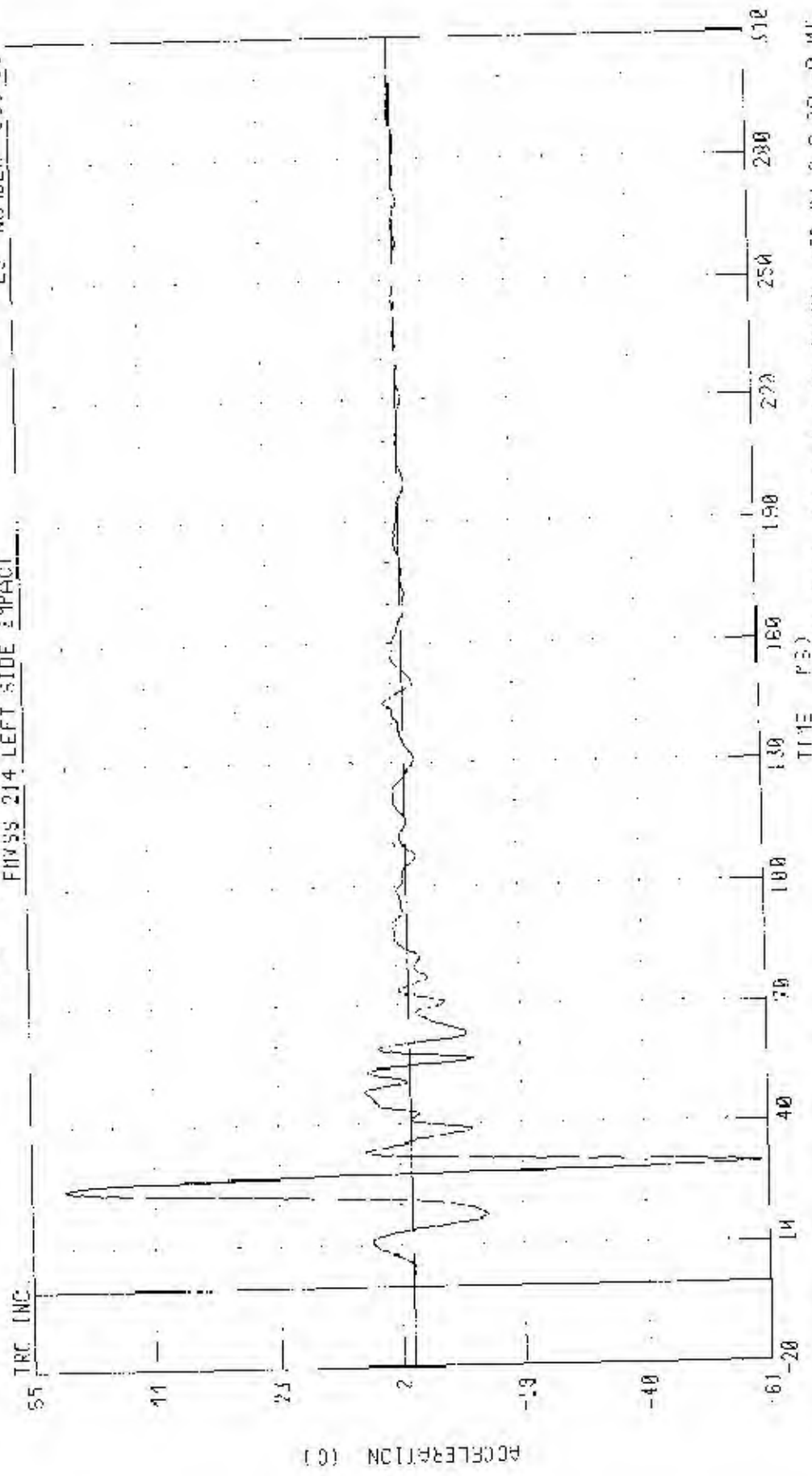
2161.3400 5.71 0.63 0.99 5.24 0.41 0.46 0.31

55/23 KPH 30 DEGREE SIDE IMPACT MOVING DEFORMABLE BARrier INTO LEFT SIDE OF 1903 BMW 325i

VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

ES- NUMBER 030430

PHYS 214 LEFT SIDE IMPACT



TIME (MS) 50 100 150 200 250 300

CHANNEL YUGZ01 FILTER 1P CLASS B0

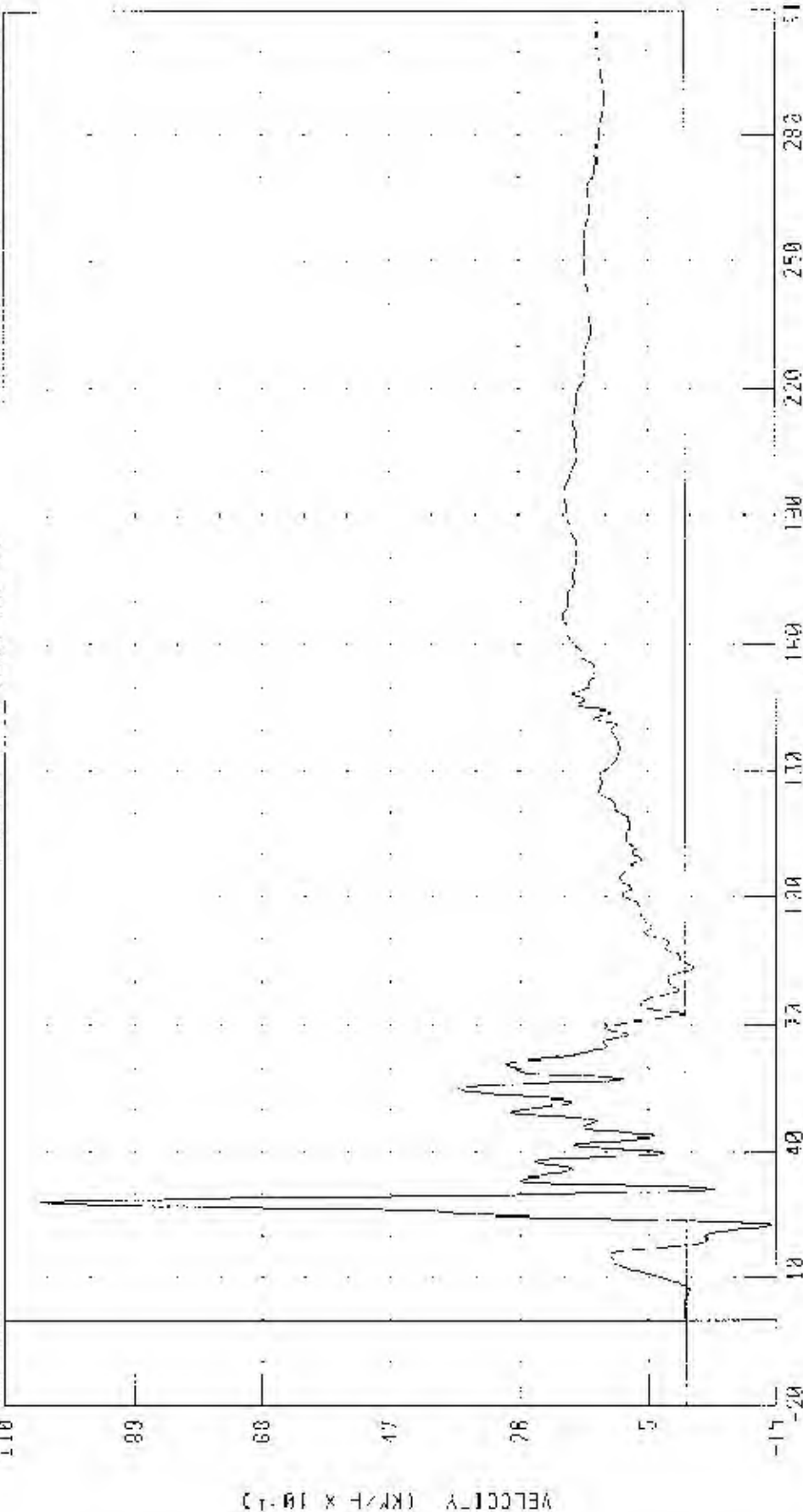
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFERRABLE BARRIER) INTO LEFT SIDE OF 240X R1W (223)

VEHICLE CENTER OF GRAVITY Z AXIS VELOCITY

TEST NUMBER: 030430

TRUSS 214 LEFT SIDE IMPACT

TRC INCL



TIME (MS)

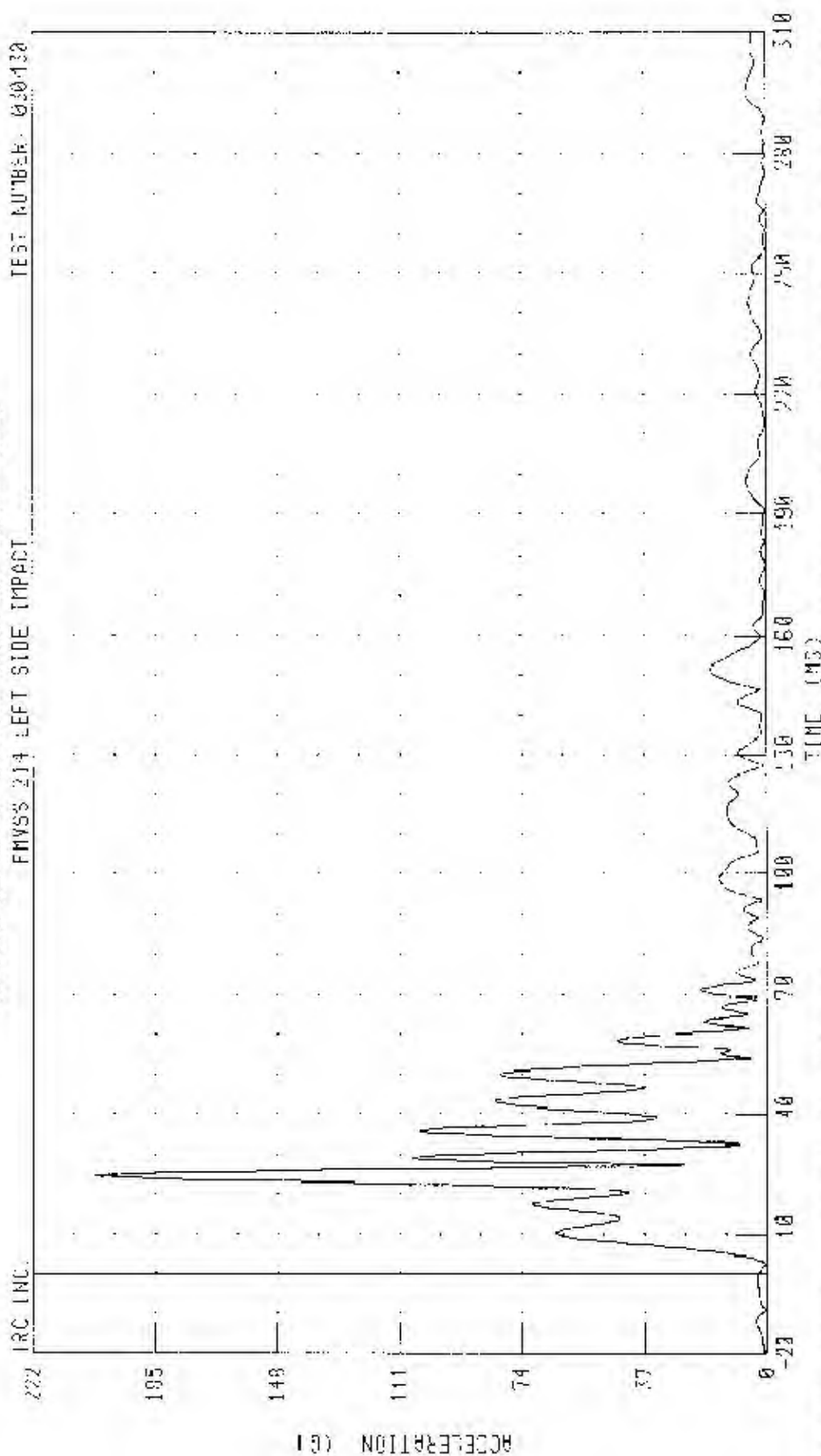
PERM DATE 18 52 41-4 25 76 MS - 41 KPH 22 61 PS

CHANNEL V002M1 FILTER CH CLASE 180

55/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

FMVSS 214 LEFT SIDE IMPACT TEST NUMBER: 030430



CHANNEL W00001 FILTER CH. CLASS 60

PEAK DATA 203.56 G @ 24.64 MS, 0.01 G @ 0.04 MS

MDB Instrumentation Plots

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

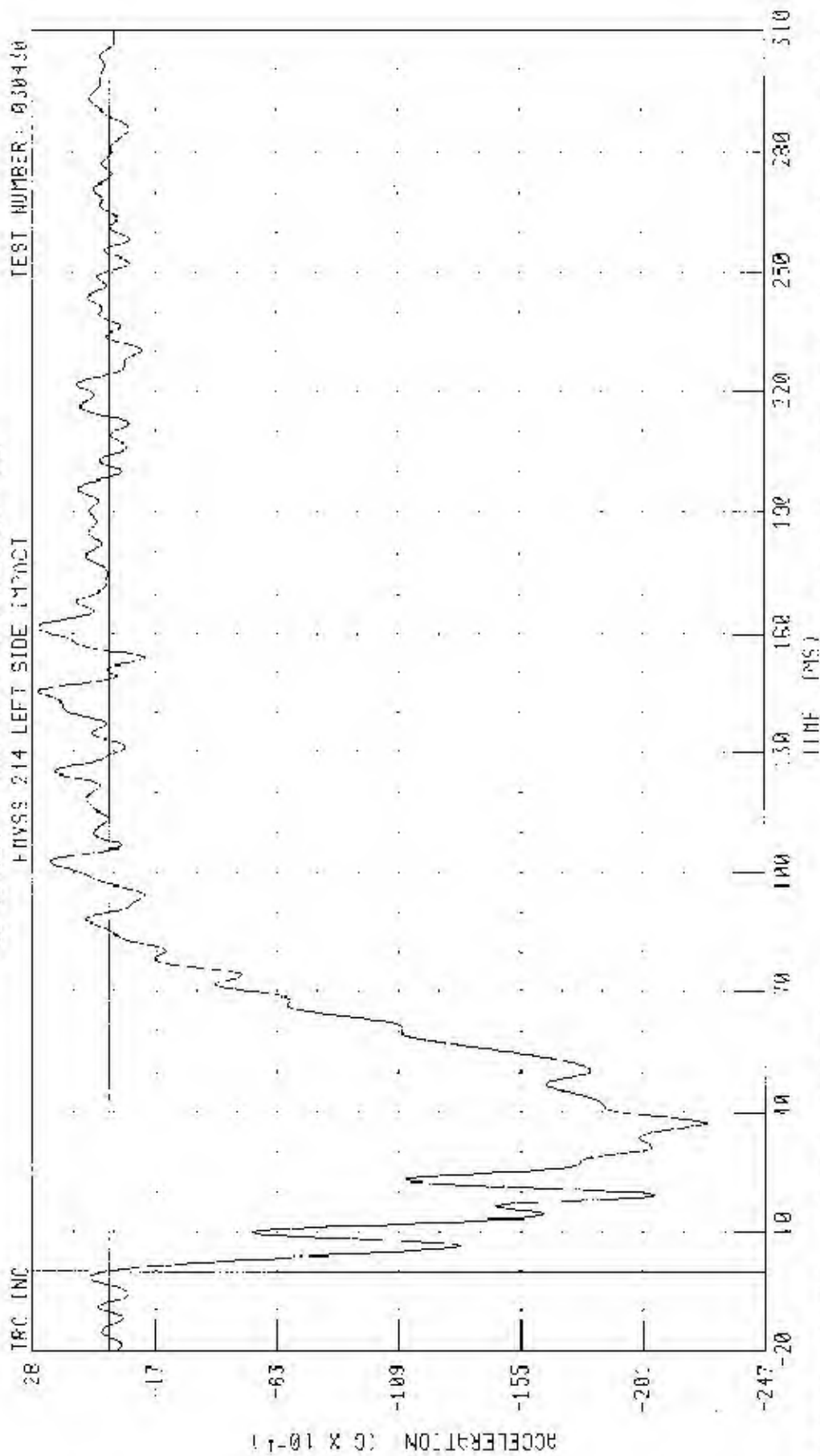
Contact Data - Filter Class 1000

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

MID CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER: 030430

FNVS 214 LEFT SIDE IMPACT



CHANNEL: B00XG1 FILTER: CR, CLASS 00

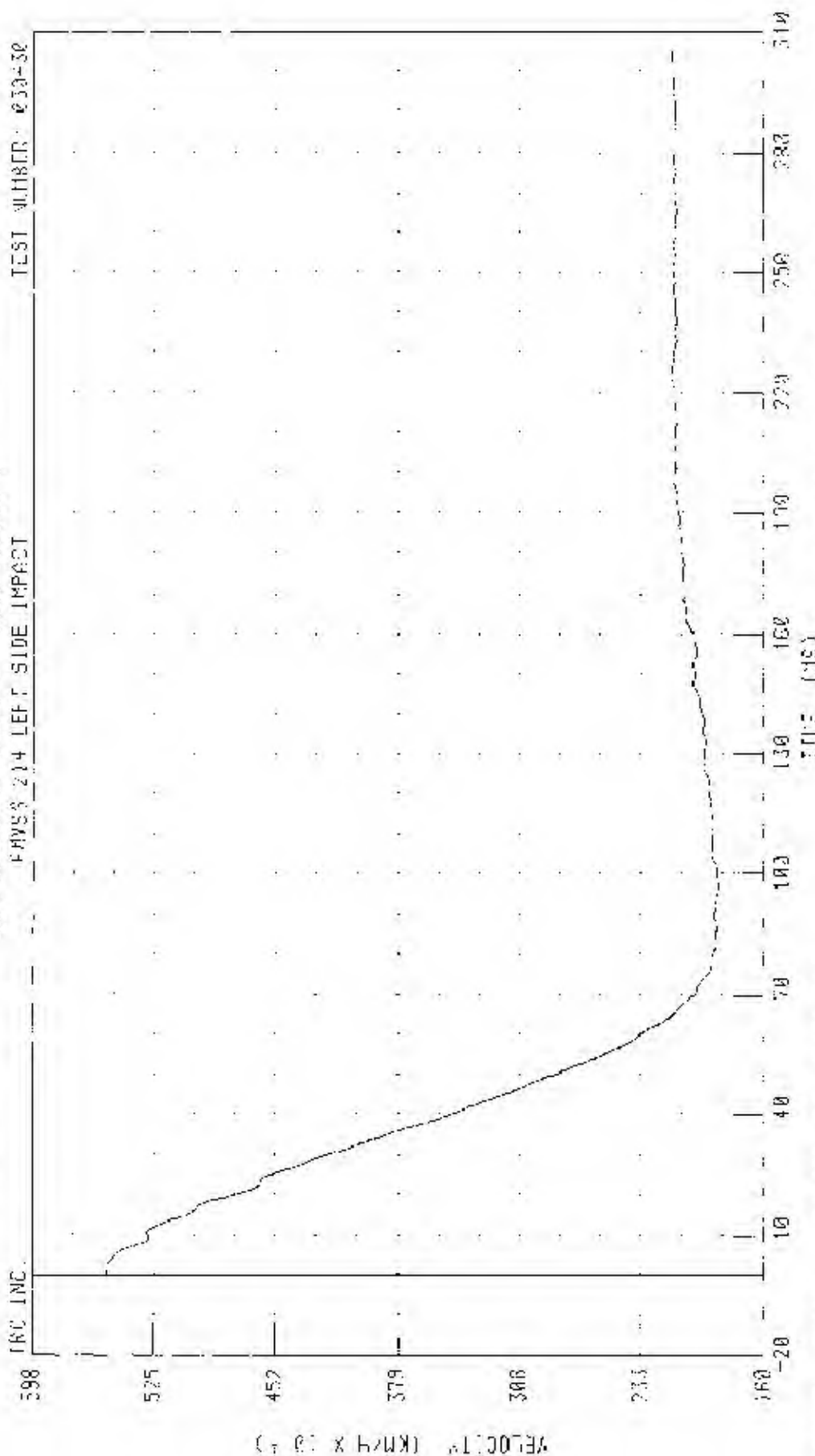
PEAK TIME: 7.67 G @ 145.04 MS; -22.44 G @ 37.29 MS

55/28 K24 90 DEGREE SIDE IMPACT CURVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 UNW 2251

NO3 CENTER OF GRAVITY X AXIS VELOCITY

PHYS# 214 LEFT SIDE IMPACT

TEST NUMBER: 030-30



TIME (MS)

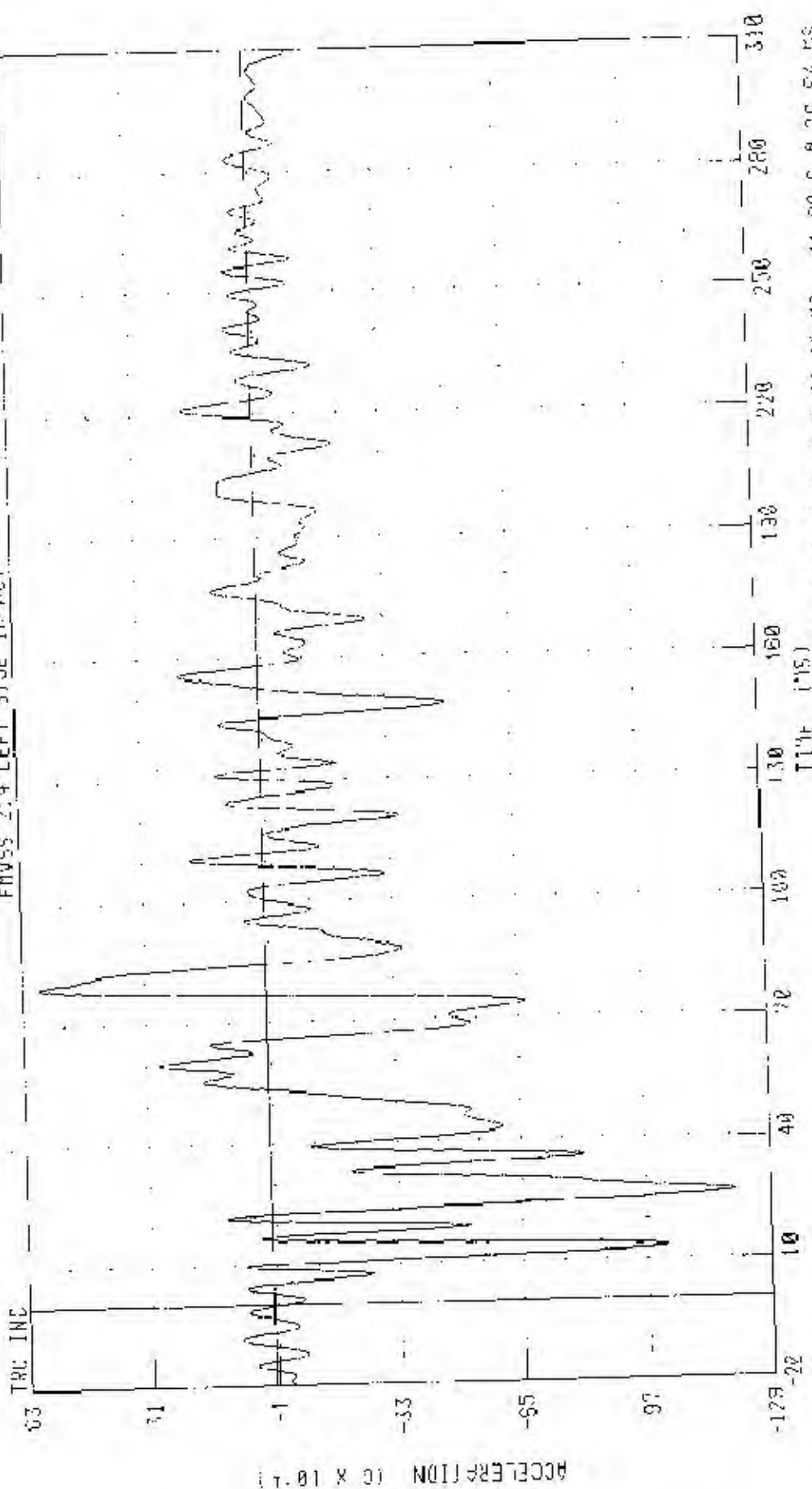
CHANNEL: B002V1 FILTER: CH CLASS: 130

PEAK DATA: 55.19 KPH 90 DEGREE SIDE IMPACT 13.02 KPH 3 97.20 MS

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BAR) INTO LEFT SIDE OF 2003 BMW 325.
 NDB CENTER OF GRAVITY Y-AXIS ACCELERATION

TEST NUMBER 030430

FMVSS 214 LEFT SIDE IMPACT



CHANNEL BODYC1 FILTER CF 31483 60

DATA 5 81 0 0 10 82 MS, -11 29 5 0 26 54 MS

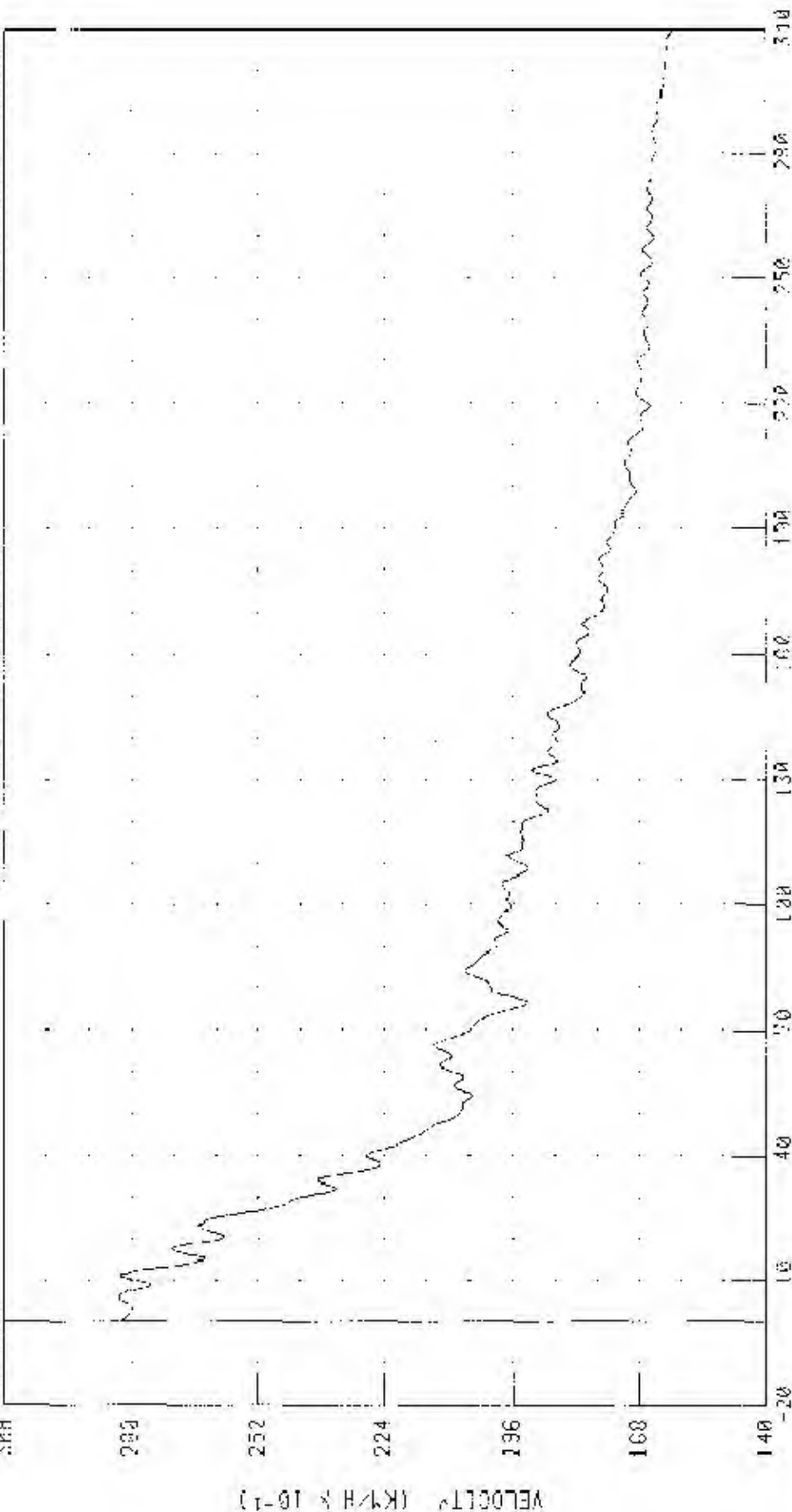
55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

Y-DB VEHICLE OF GRAVITY Y AXIS VELOCITY

TRC INC.

PHASE 214 LEFT SIDE IMPACT

TEST NUMBER 330430



TIME (MS)

CHANNEL: BCCW2 SILEN: CH CLASS 184

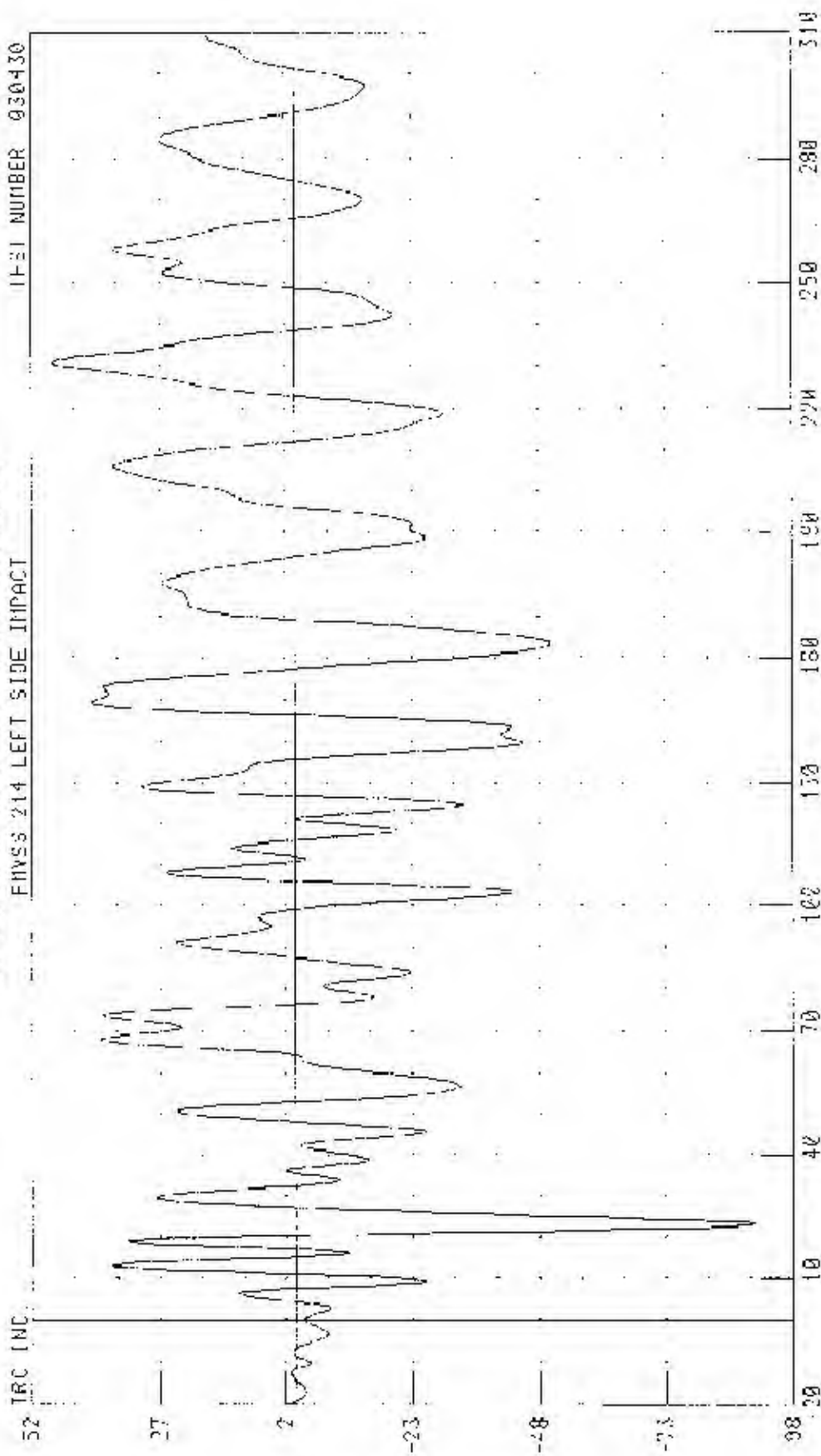
PEAK DATA 20 26 KPH 2 5 64 18 10 02 KPH 1 8 310 20 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INITIAL LEFT SIDE OF 2003 BMW 325i

103 CENTER OF GRAVITY Z-AXIS ACCELERATION

IFBI NUMBER 030430

FMVSS 214 LEFT SIDE IMPACT

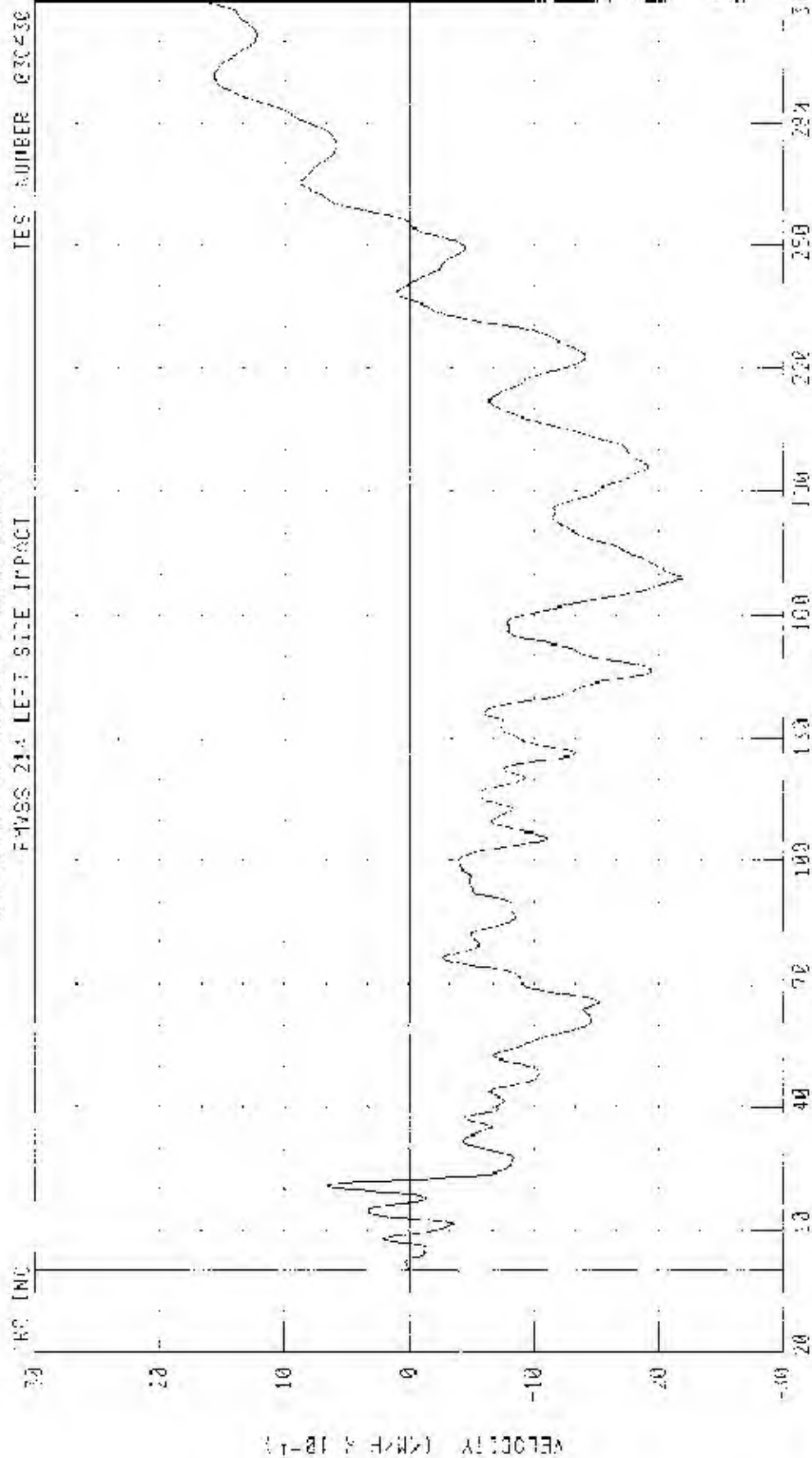


ACCELERATION 10 x 10^-4

PEAK DATA = 32.0 @ 230.96 MIS. -0.25 G @ 22.96 MS

CHANNEL B00701 FILTER: CII. CLASS C0

55-228 KPH 2P DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 ENH 3251
 END CENTER OF GRAVITY Z-AXIS VELOCITY



CHANNEL BCC79; FILTER OF CLASS 150

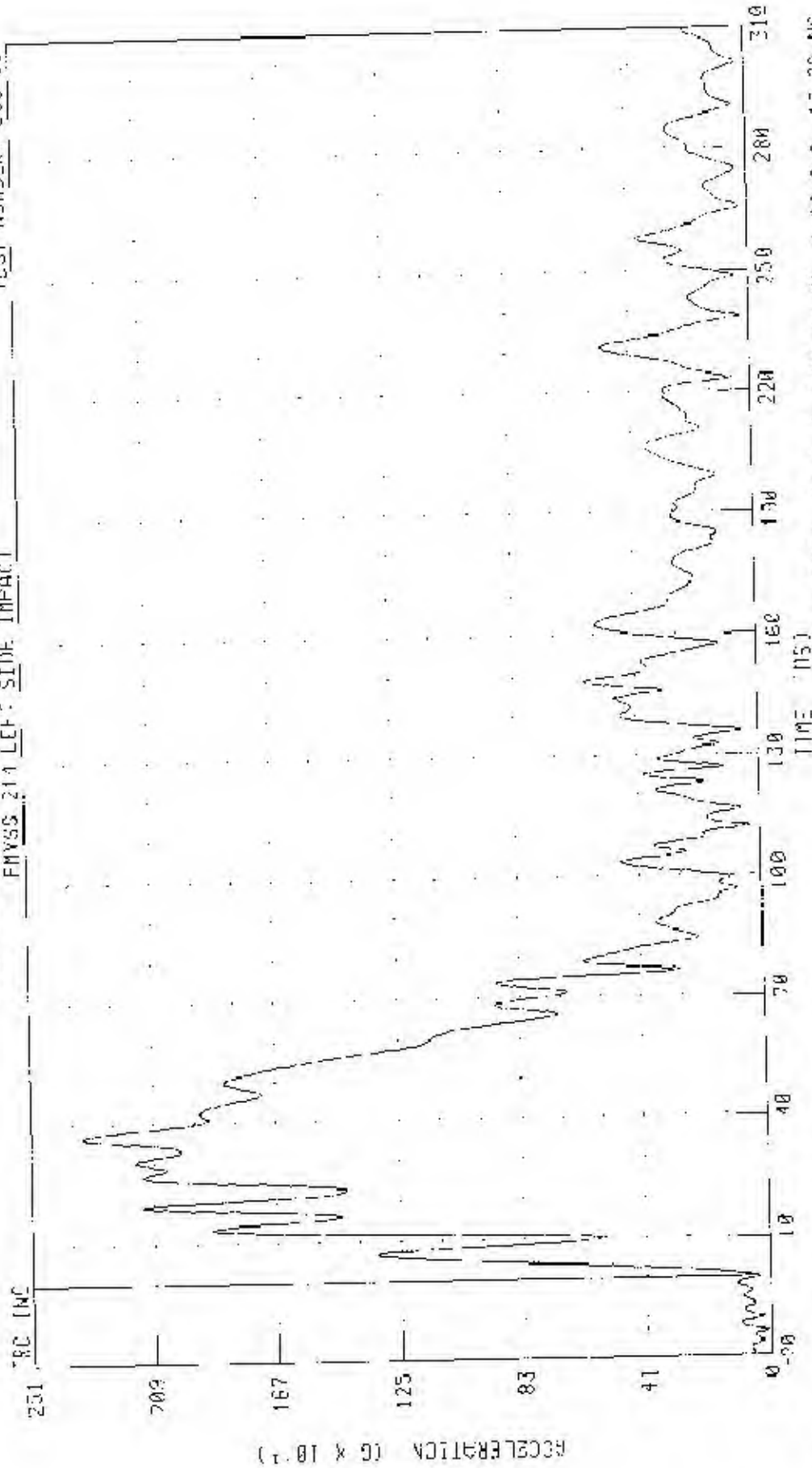
TIME (S)

PEAK DATA 62 KPH @ 73.00 MS, -2.19 KPH @ 169.10 MS

55/70 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i
 HCR CENTER OF GRAVITY RESILIENT ACCELERATION

TEST NUMBER: 030430

PHYS 214 LEFT SIDE IMPACT



ACCELERATION (G x 10⁻¹)

TIME (MS)

PEAK DATA: 23.47 5 8 38 64 MS. 0 20 0 6 13 00 MS

CHANNEL: BCGR32 FILTER: CH CLOSS: 00

55/28 KOP 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE AMPLIFIER) INDC LEFT SIDE 2003 31W 33S

NOB LEFT REAR X AXIS ACCELERATION

TEST NUMBER 030430

FWSS 214 LEFT SIDE IMPACT

100 MHz

40

30

20

10

0

-10

-20

-30

-40

-50

-60

-70

-80

-90

-100

-110

-120

-130

-140

-150

-160

-170

-180

-190

-200

-210

-220

-230

-240

-250

-260

-270

-280

-290

-300

-310

-320

-330

-340

-350

-360

-370

-380

-390

-400

-410

-420

-430

-440

-450

-460

-470

-480

-490

-500

-510

-520

-530

-540

-550

-560

-570

-580

-590

-600

-610

-620

-630

-640

-650

-660

-670

-680

-690

-700

-710

-720

-730

-740

-750

-760

-770

-780

-790

-800

-810

-820

-830

-840

-850

-860

-870

-880

-890

-900

-910

-920

-930

-940

-950

-960

-970

-980

-990

-1000

-1010

-1020

-1030

-1040

-1050

-1060

-1070

-1080

-1090

-1100

-1110

-1120

-1130

-1140

-1150

-1160

-1170

-1180

-1190

-1200

-1210

-1220

-1230

-1240

-1250

-1260

-1270

-1280

-1290

-1300

-1310

-1320

-1330

-1340

-1350

-1360

-1370

-1380

-1390

-1400

-1410

-1420

-1430

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-1460

-1470

-1480

-1490

-1500

-1510

-1520

-1530

-1540

-1550

-1560

-1570

-1580

-1590

-1600

-1610

-1620

-1630

-1640

-1650

-1660

-1670

-1680

-1690

-1700

-1710

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-1730

-1740

-1750

-1760

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-1790

-1800

-1810

-1820

-1830

-1840

-1850

-1860

-1870

-1880

-1890

-1900

-1910

-1920

-1930

-1940

-1950

-1960

-1970

-1980

-1990

-2000

-2010

-2020

-2030

-2040

-2050

-2060

-2070

-2080

-2090

-2100

-2110

-2120

-2130

-2140

-2150

-2160

-2170

-2180

-2190

-2200

-2210

-2220

-2230

-2240

-2250

-2260

-2270

-2280

-2290

-2300

-2310

-2320

-2330

-2340

-2350

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-2770

-2780

-2790

-2800

-2810

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-2860

-2870

-2880

-2890

-2900

-2910

-2920

-2930

-2940

-2950

-2960

-2970

-2980

-2990

-3000

-3010

-3020

-3030

-3040

-3050

-3060

-3070

-3080

-3090

-3100

-3110

-3120

-3130

-3140

-3150

-3160

-3170

-3180

-3190

-3200

-3210

-3220

-3230

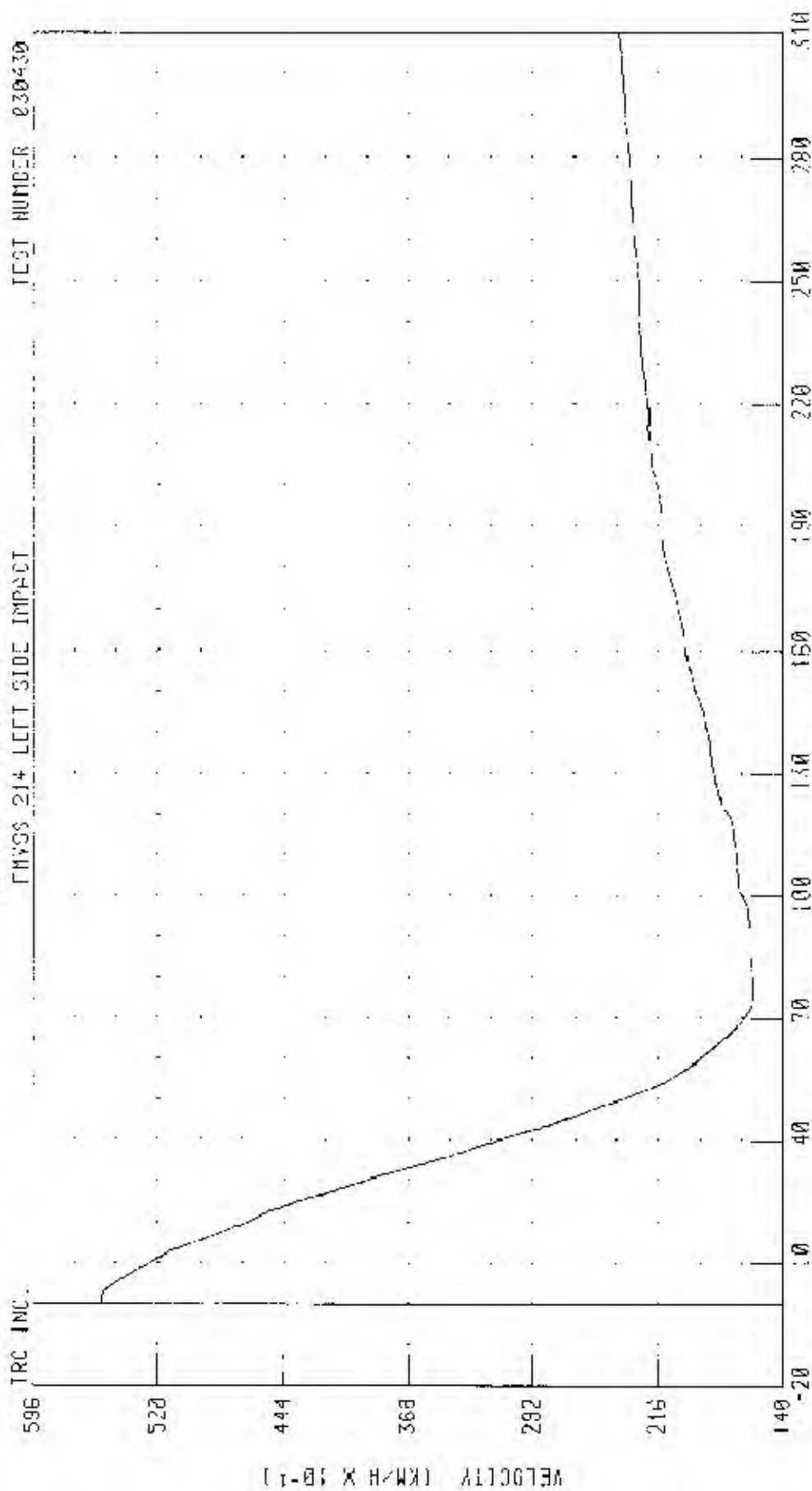
-3240

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

NCB LEFT REAR X-AXIS VELOCITY

TRC INC. FVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



TIME (MS)

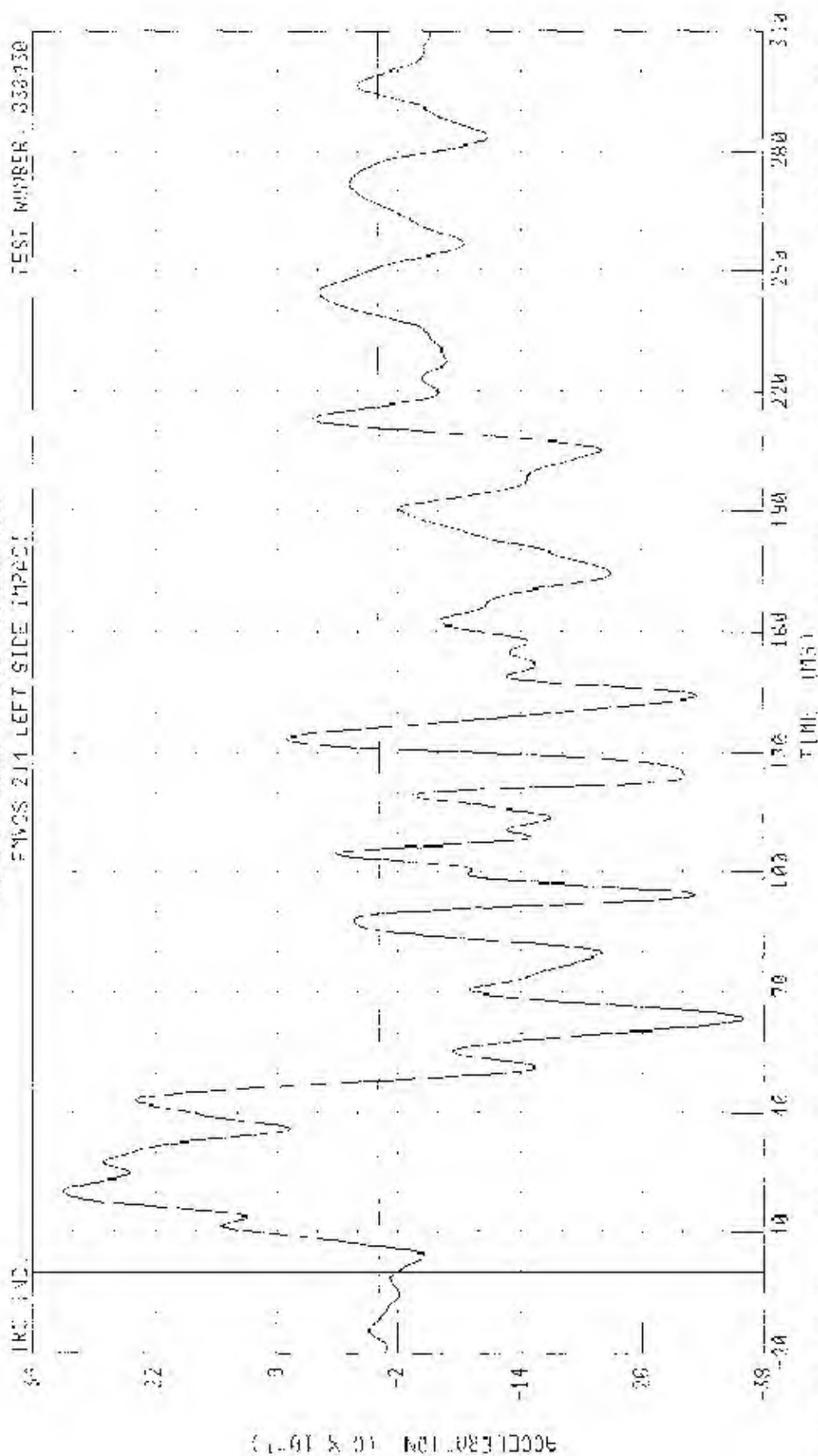
CHANNEL LRR-VI FILTER CHL CLASS 180

PEAK DATA: 55.42 KPH @ 1.76 MS, 15.77 KPH @ 77.63 MS

55 MPH 90 DEGREE SIDE IMPACT (MOVING DETONABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

AND LEFT REAR Y AXIS ACCELERATION

SVCS 214 LEFT SIDE IMPACT TEST NUMBER: 030430



C-ANAL (RRVS) FILTER CH CLASS 50

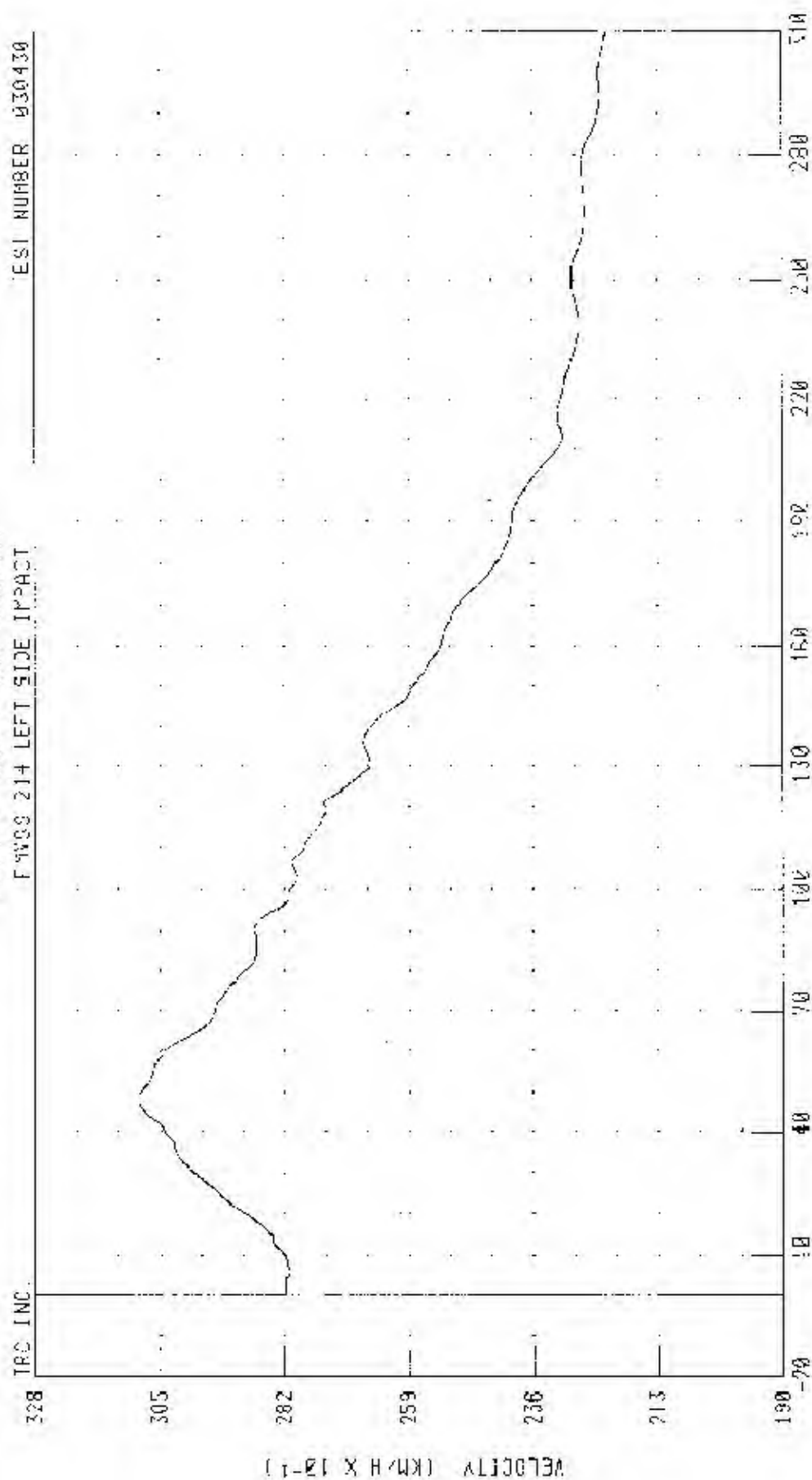
PEAK DUTY 3.11 0.0 20.32 MS -3.62 0.0 63.44 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

MIDH 1-FR REAR Y-AXIS VELOCITY

FWSS 214 LEFT SIDE IMPACT

ESI NUMBER W30430



TIME 1951

PEAK DATA 30 OF KPH @ 48.42 MS, 22 22 KPH @ 310 00 MS

CHANNEL 1 RRYV1 FILTER: CIL CLASS 100

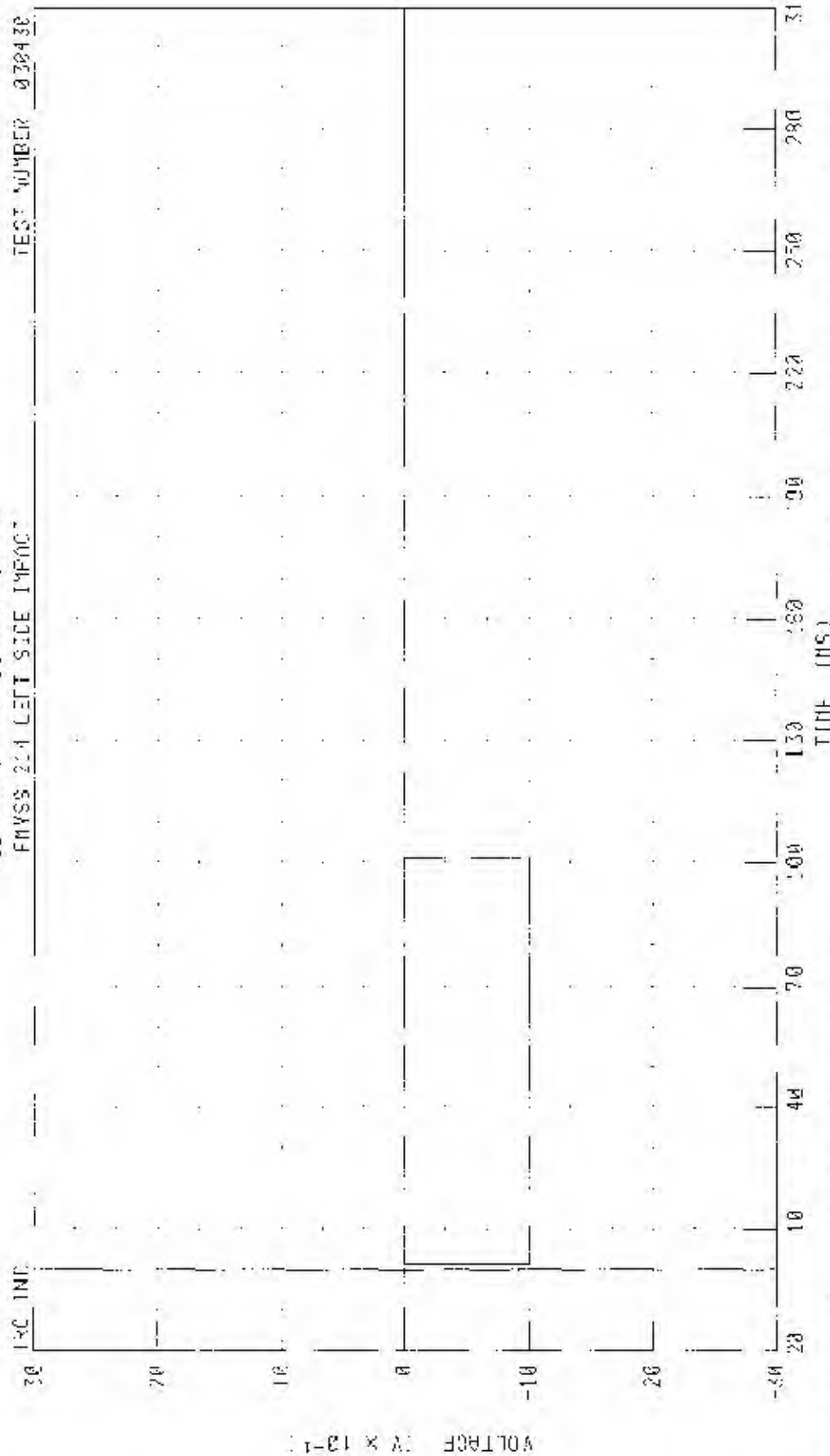
VELOCITY (KPH X 12-1)

13C NMR

HILL:MS - JOURNAL - JULIS 1931B 30A

FMVSS 224 LEFT SIDE IMPACT

TEST NUMBER 93243E



CHANNEL - NOBEL FILTER - CLASS 1000

DEKORATIONEN UND VERGÄLTERUNGEN

TEST WLMHR 930439



TABLE 1. *Continued*

Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered

55/20 KPH 50 DEGREE STIFF IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER UPPER RIB Y AXIS ACCELERATION

TEST NUMBER 030430

TRC INC.

61

49

37

25

13

1

-11

-20

ACCELERATION (G)

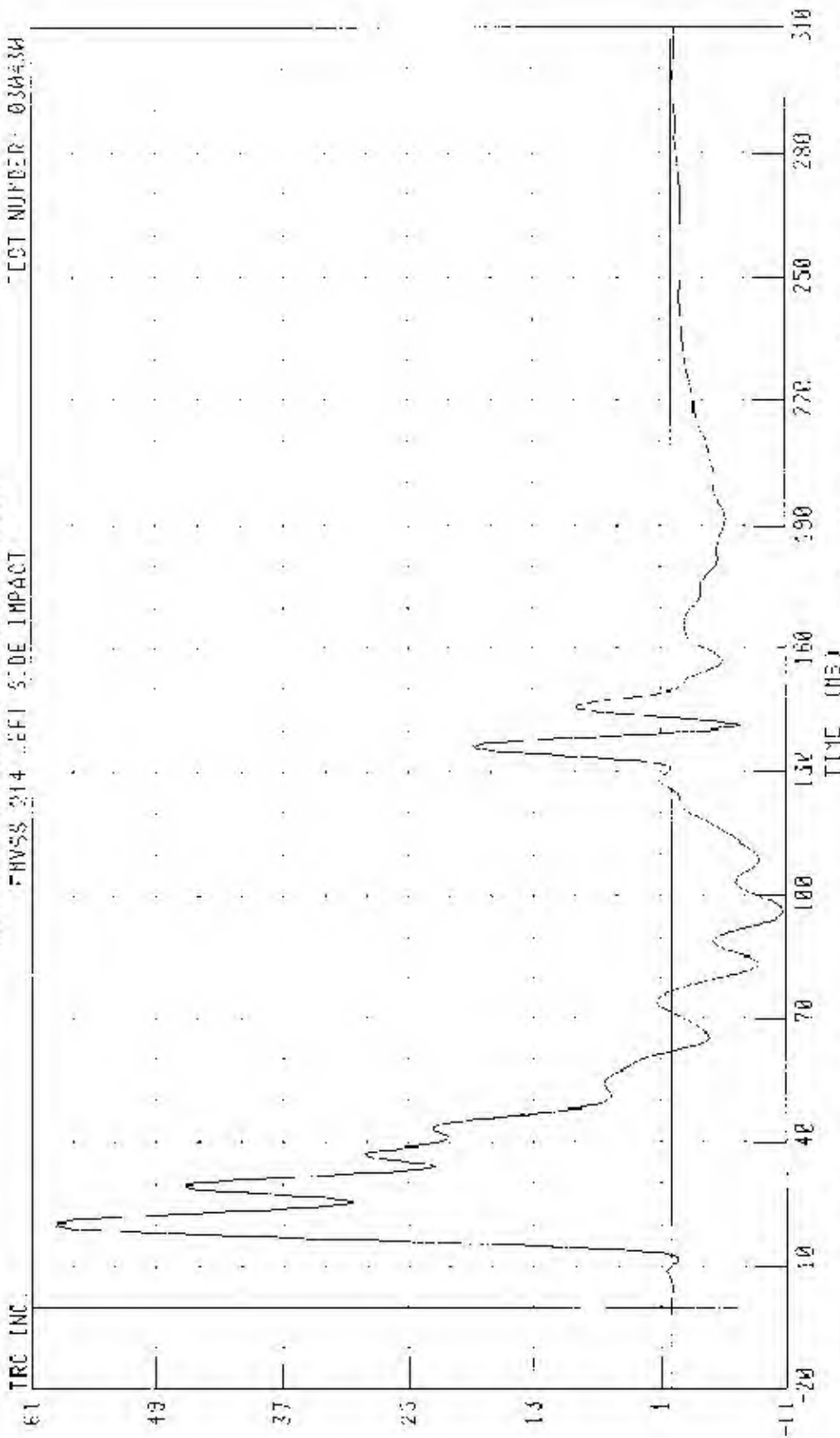
B-150

030430

CHANNEL: UR70 FILTER: FIR 100

TIME (MS)

PEAK DATE 58 82 6 8 20.22 43. 10.74 3 0 96.23 15

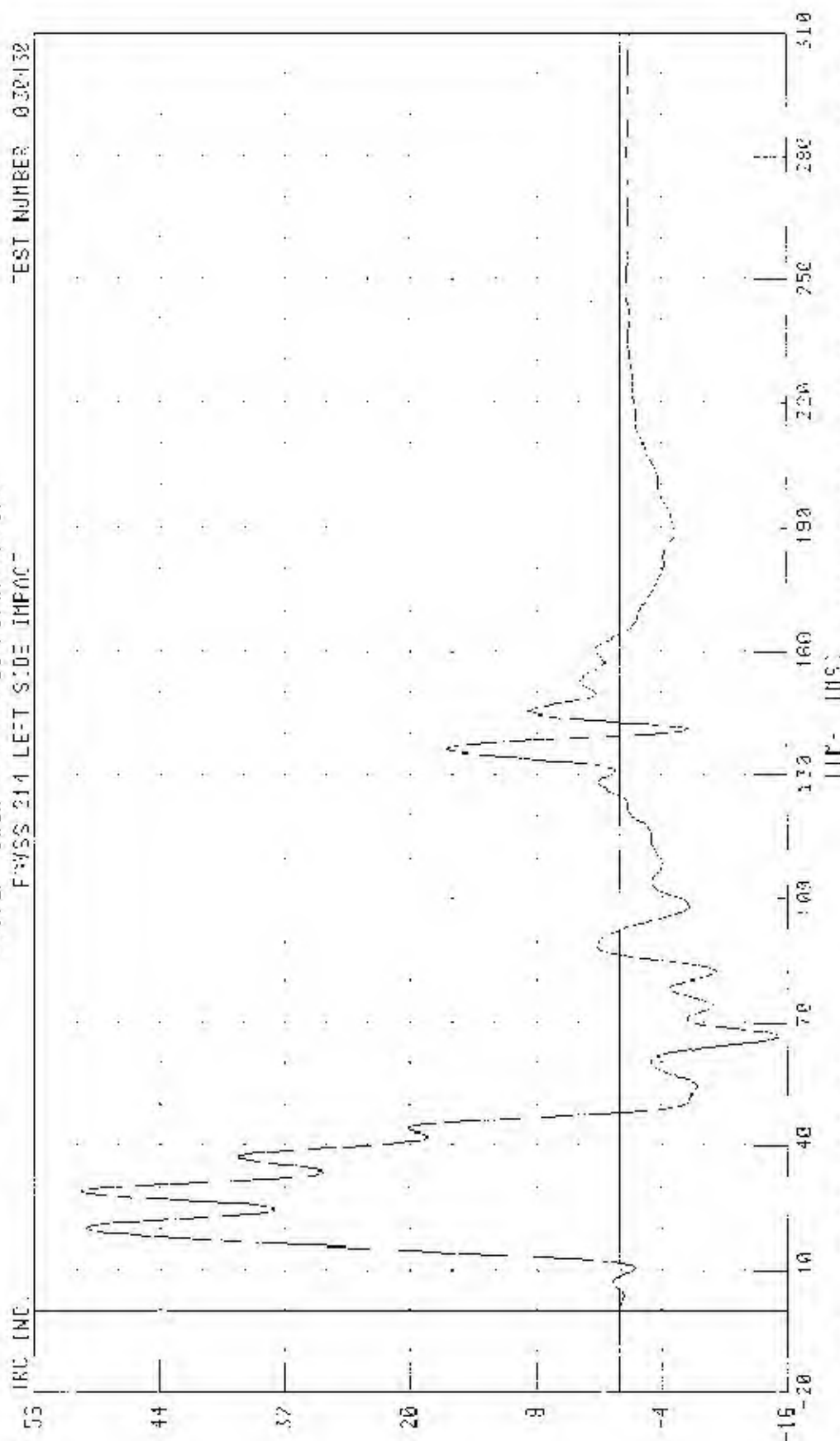


20/28 MPH 90 DEGREE SUB- IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BAY 3251

DRIVER LOWER RIB V AXIS DECELERATION

FWSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



ACCELERATION (g)

B-151

030430

CHANNEL 1: CLAYG1 FILTER: FIR 180

11P-11MS

PERF 2010 51 53 0 0 28 75 MS -15 18 0 6 86 25 18

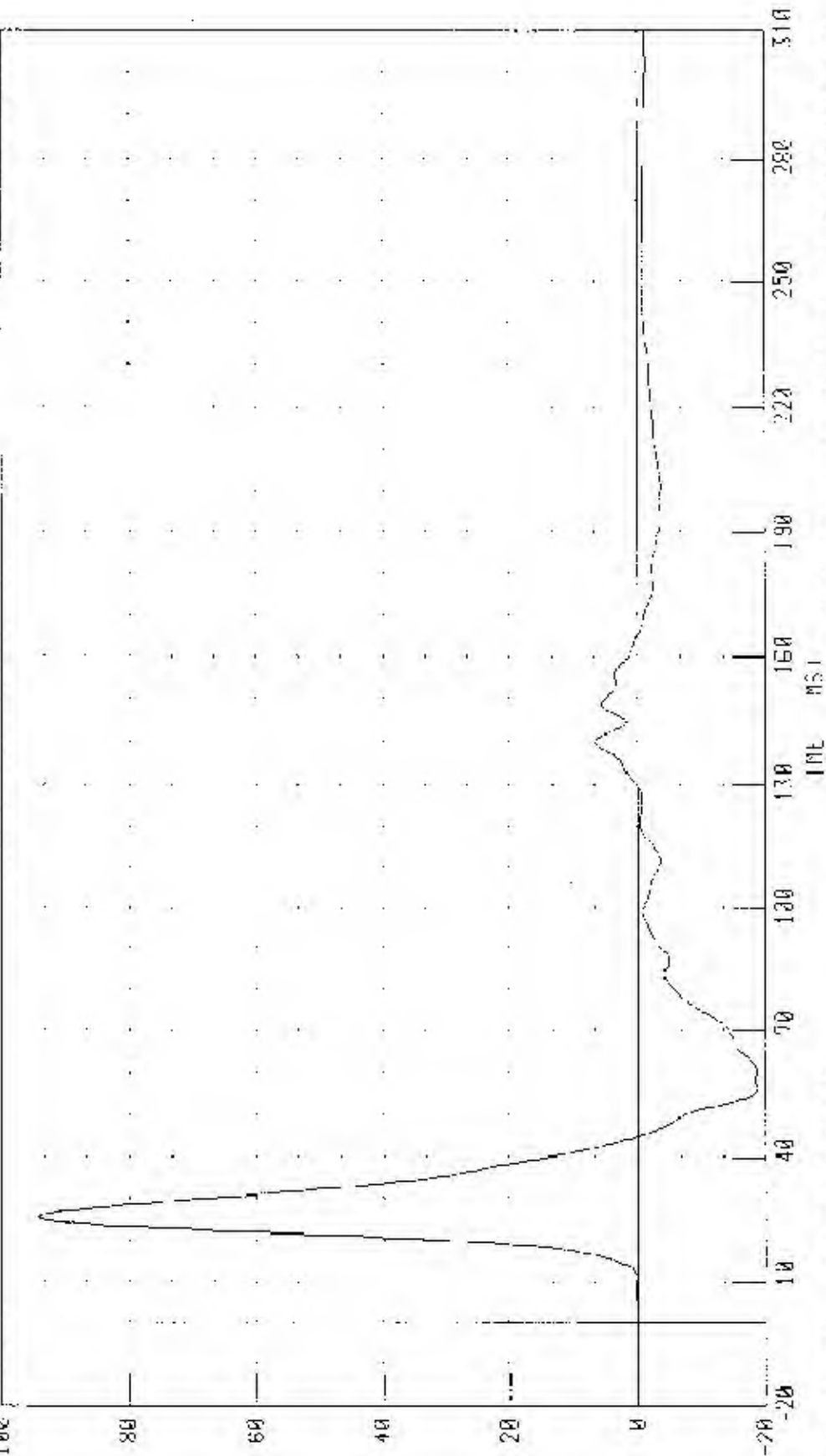
55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325I

DRIVER LOWER SPINE Y-AXIS ACCELERATION

FRYSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030430

TRC INC.



ACCELERATION (G)

CHANNEL 112761 FILTER: FIR 130

TIME (ms)

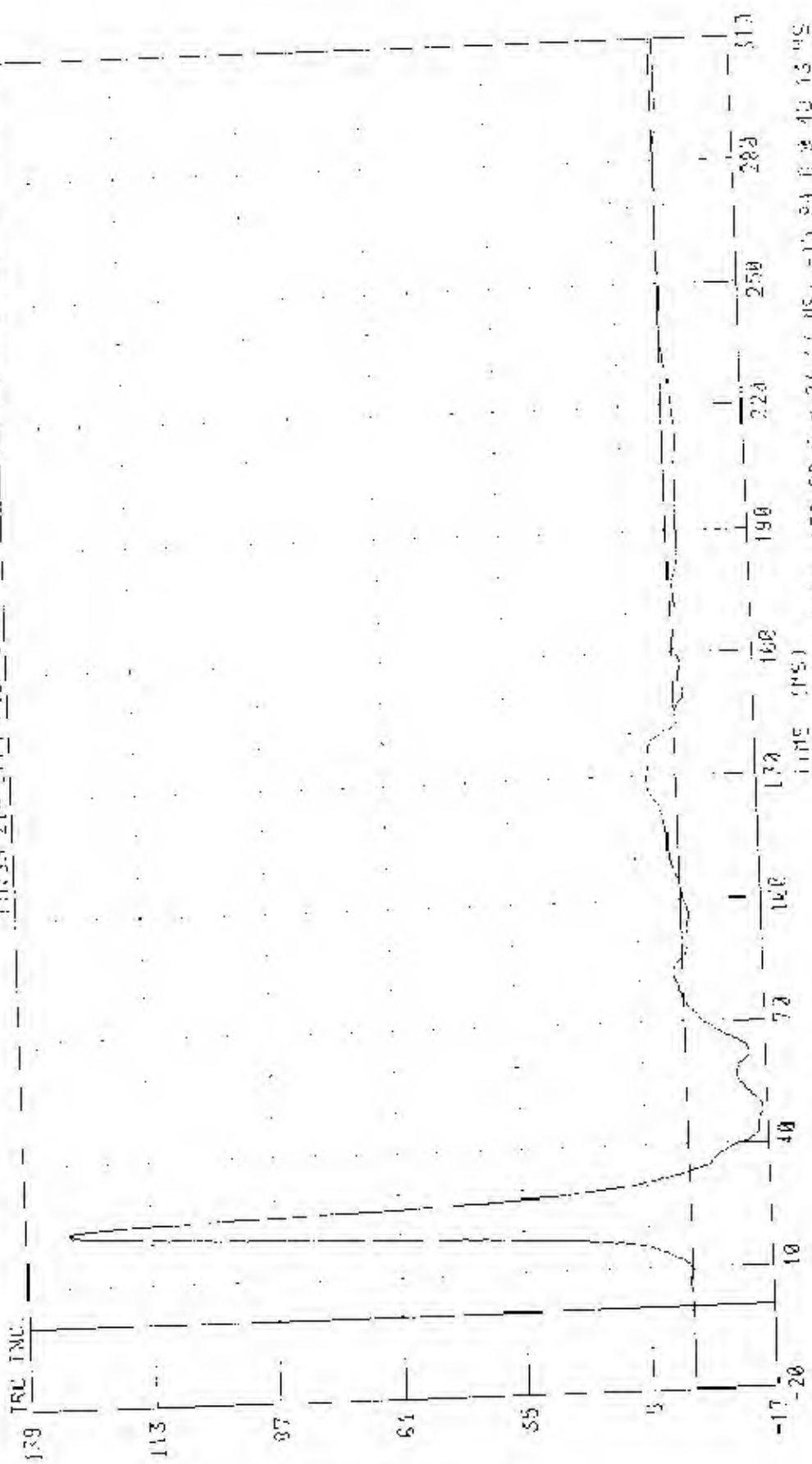
PEAK DATA: 94.32 G @ 25.63 MS, 10.52 G @ 130.52 MS

55/28 RPM 30 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER - INTO LEFT SIDE OF 2005 BMW 320i

DRIVER SEAT'S Y-AXIS ACCELERATION

TEST NUMBER: 030430

PHYS 214 LEFT SIDE IMPACT



CHANNEL: PCV51 FILTER: FIR 100

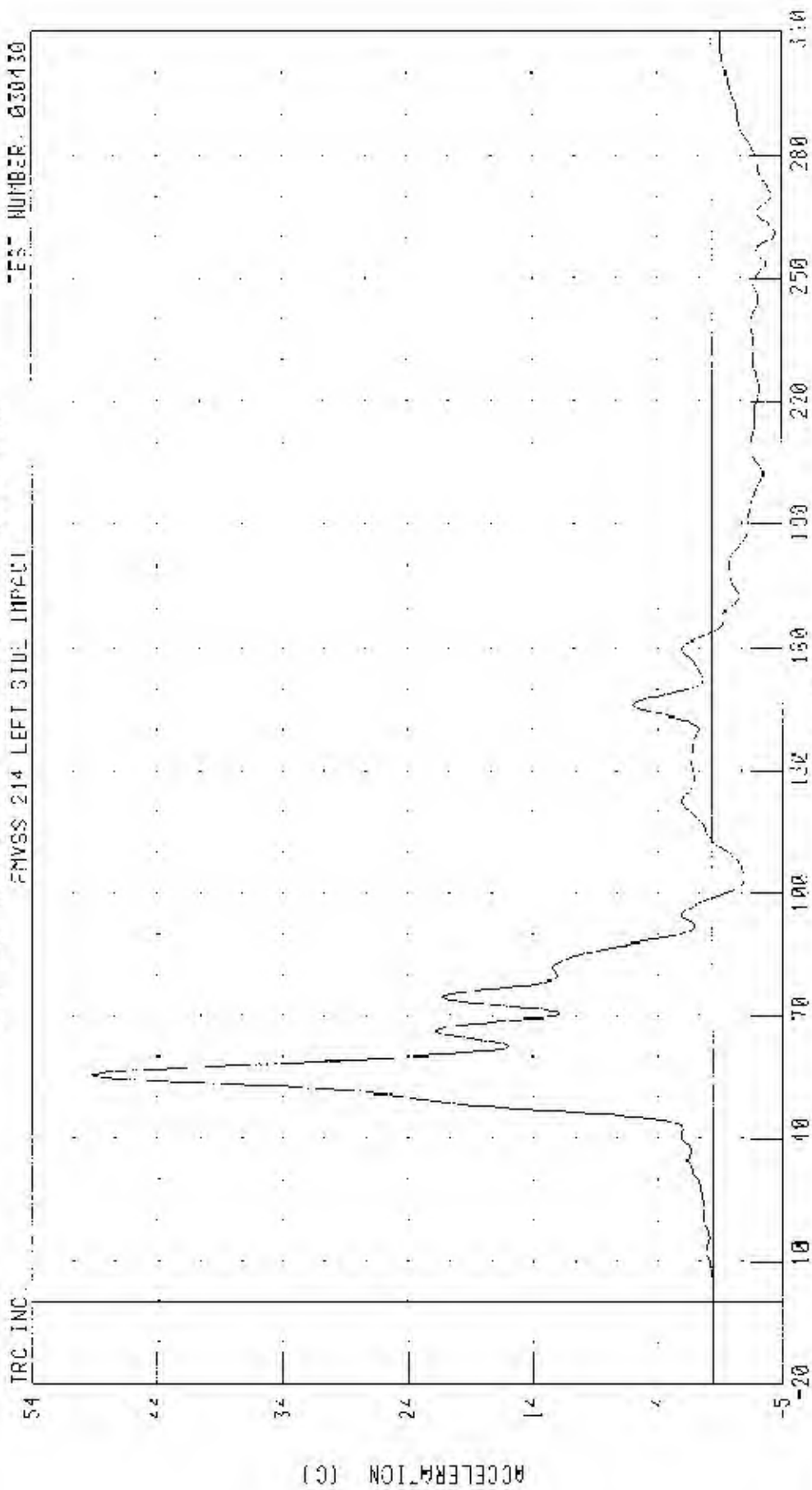
PLK DATA 130 29 0 23 11 MS: -10.84 0 0 10 13 MS

55/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2005 BMW 325i

LEFT REAR PASSENGER UPPER RID Y AXIS ACCELERATION

TEST NUMBER: 030430

ENVSS 214 LEFT SIDE IMPACT

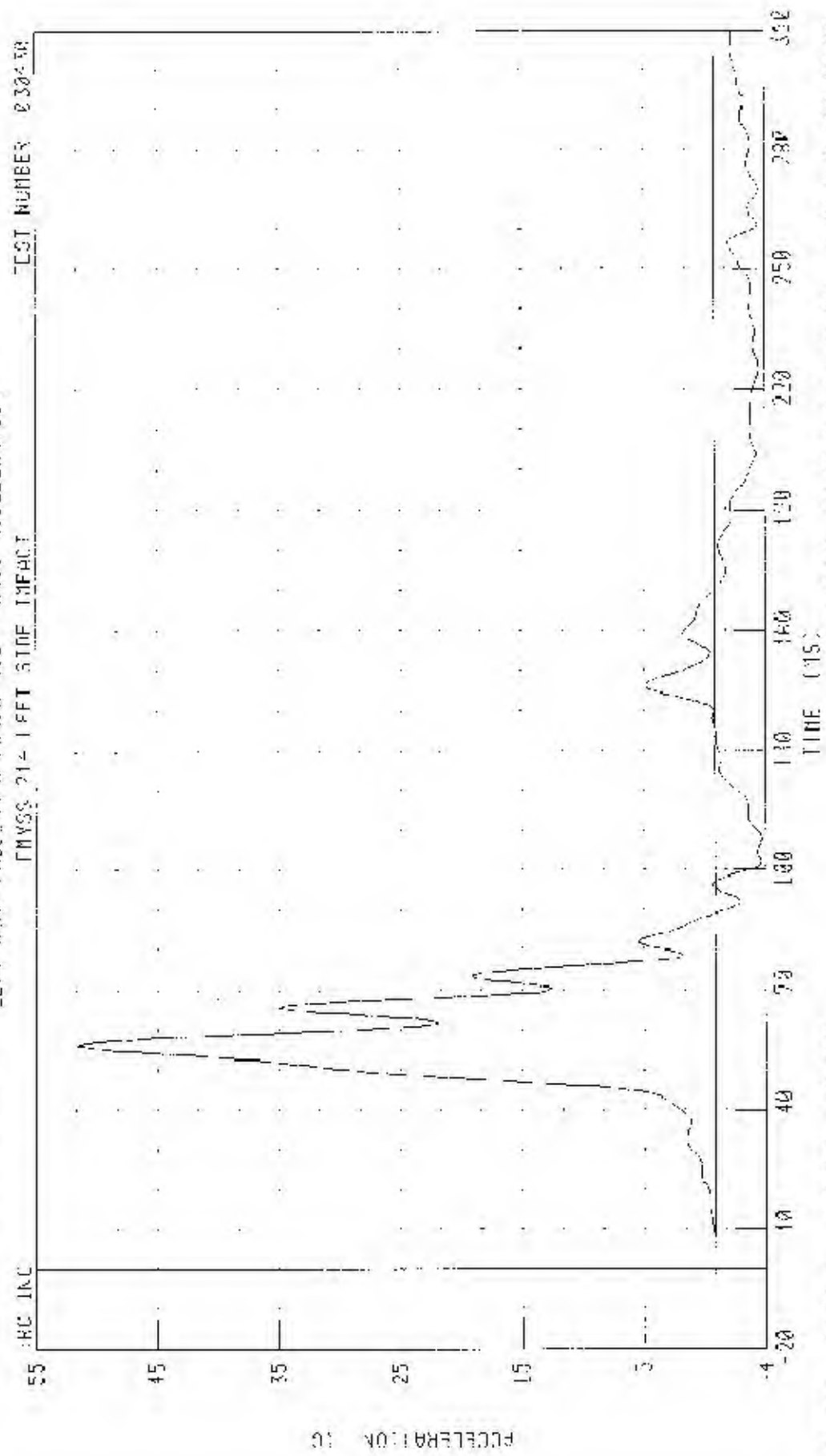


CHANNEL: CURV04 FILTER: FIR 100

PEAK DETECT: 49.85 G @ 55.63 MS; -5.13 G @ 261.25 MS

35/28 KPH 90 DEGREE SIDE IMPACT (MOVING CRYSTABLE BARRIER) INITIAL SIDE OF 2003 DMV 3251

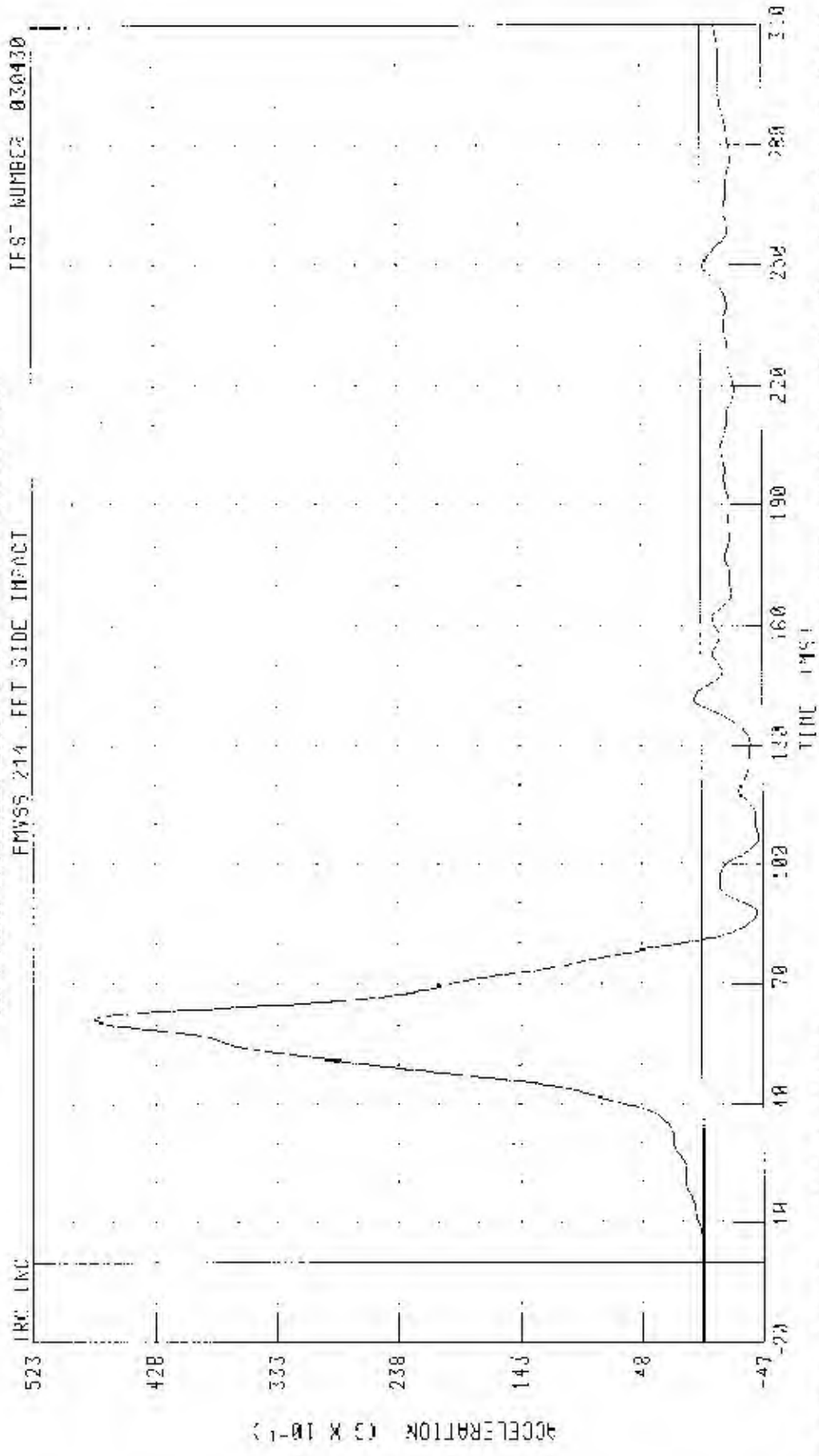
LEFT REAR PASSENGER-SIDE CYBER RID VEHICLE ACCELERATION



CHANNEL: LL2004 FILTER: FIR 120

PEAK DATA: 50.35 G @ 55.25 MS, -0.84 G @ 103.13 MS

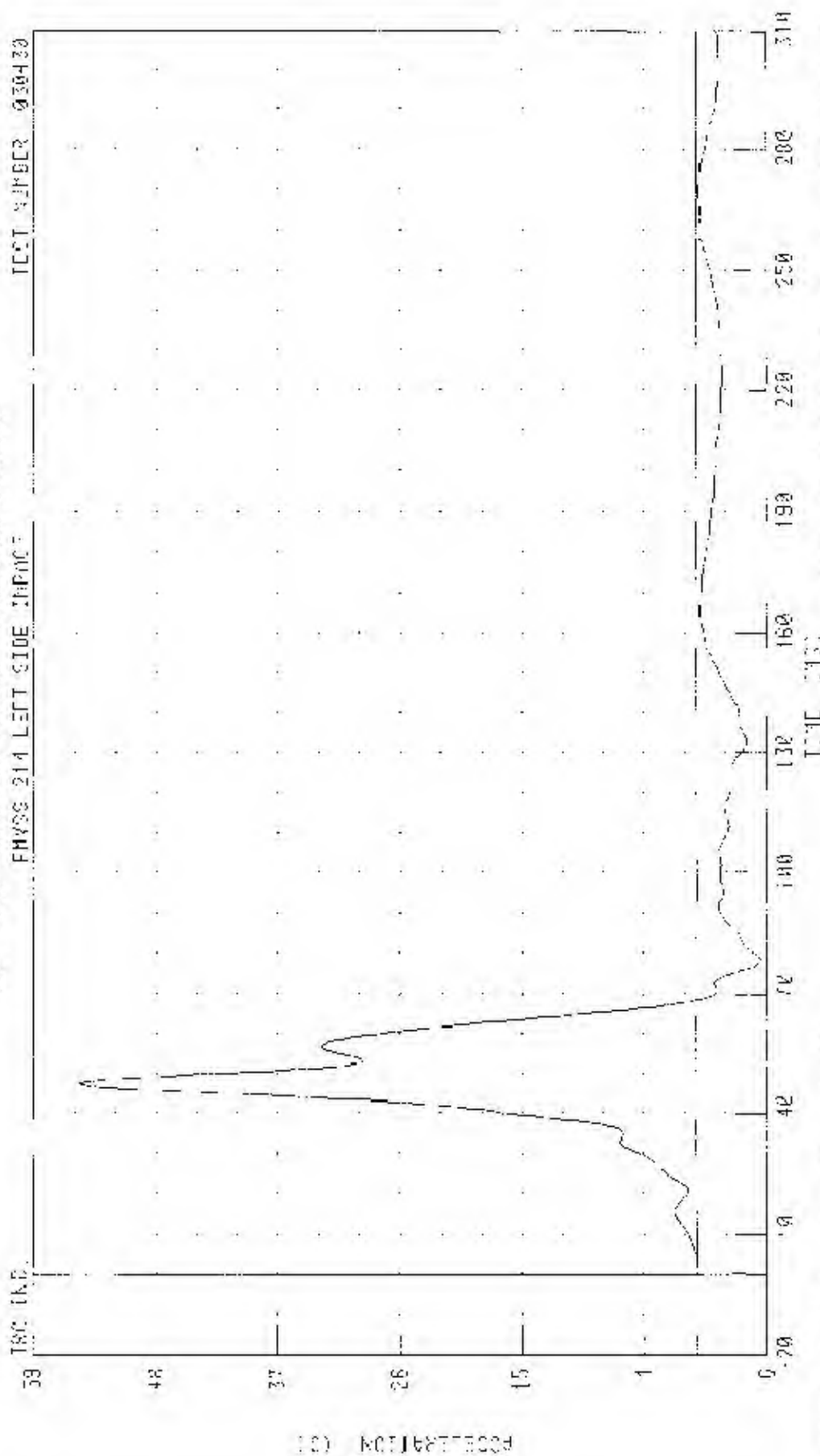
55/23 4PH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARR 2R: INTO LEFT SIDE OF 2003 BMW 320i)
 LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION



TEST NUMBER 030430

CHANNEL: T12Y04 FILTER: FIR 100 PEAK DATA: 47.54 G @ 61.25 MS, -4.32 G @ 105.87 MS

55-20 KPI 50 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 BMW 325i)
LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION



JANUARY 1994 MILLER 13 120

FILE 0071 03 85 00 49 50 NS; -5 21 00 90 13 MS

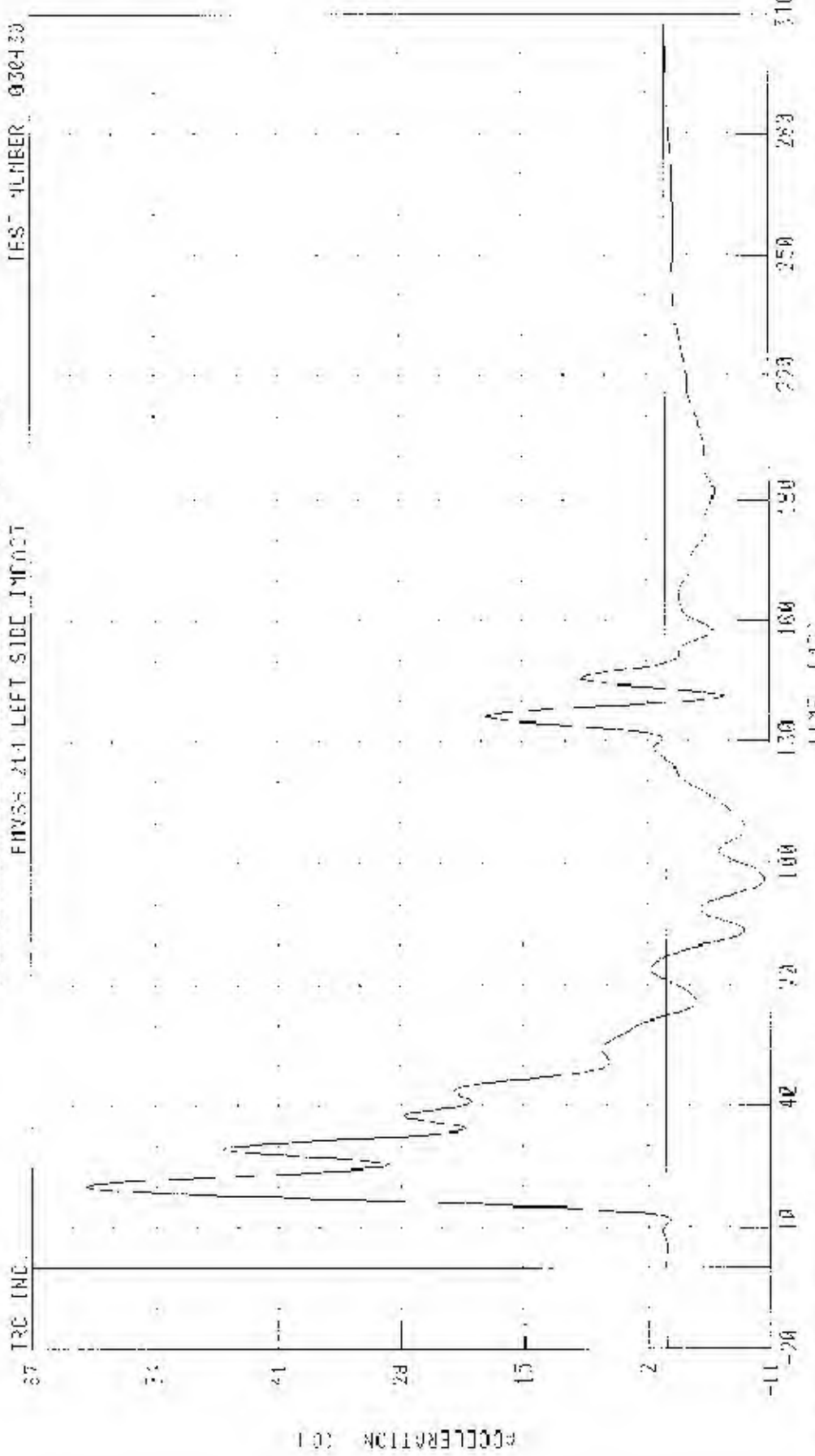
Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered - Redundant

55/28 K018 58 DEGREE SIDE IMPACT (DRIVING DEFORMABLE OBJECT) INTO LEFT SIDE OF 1989 F1W 3251

DRIVER SEATER RIB 3-4x18 REDUNDANT ACCELERATION

TEST NUMBER 030430

FINISH 214 LEFT SIDE IMPACT



TIME (MS)

PEAK DATA 51 55 10 20 00 MS 10 43 00 20 25

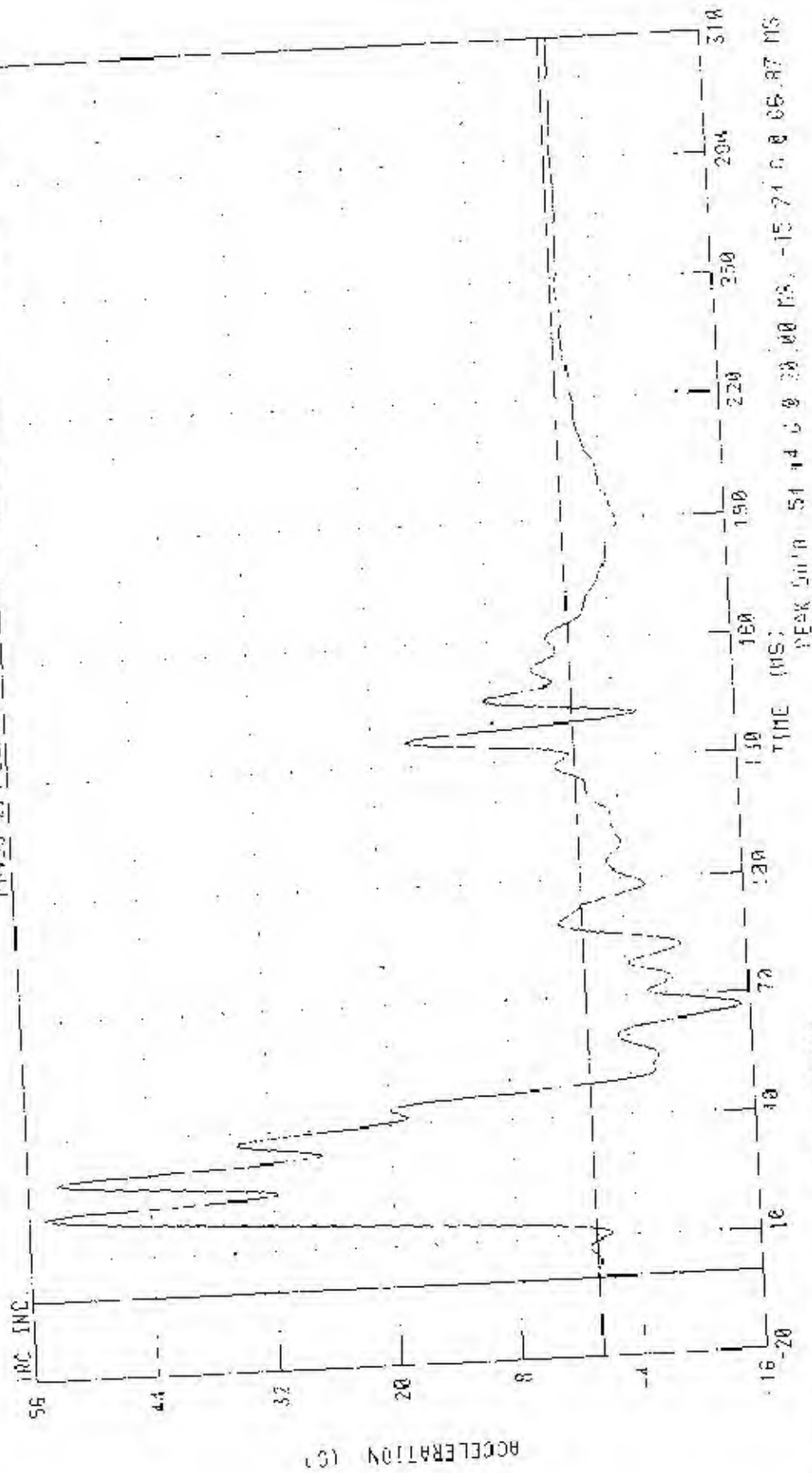
CHARGE (JURY2) FILTER 11K 100

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 200'S BHW 3251

CRISPER LOWER RIB Y AXIS REDUNDANT ACCELERATION

TEST NUMBER 030430

INVEST 214 LEFT SIDE IMPACT



CHANNEL 1 (LEFT) FILTER (100)

030430

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) 1/17/71 LEFT SIDE OF 2003 RHW 3251

DRIVER SEATER SPINE T-XIS ACCELERATION ACCELERATION

INVEST 214 LEFT SIDE IMPACT

TEST NUMBER 030430

101 TRC NO

31

61

41

21

1

-18

ACCELERATION 101

100

200

300

400

500

600

700

800

900

1000

1100

1200

1300

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32300

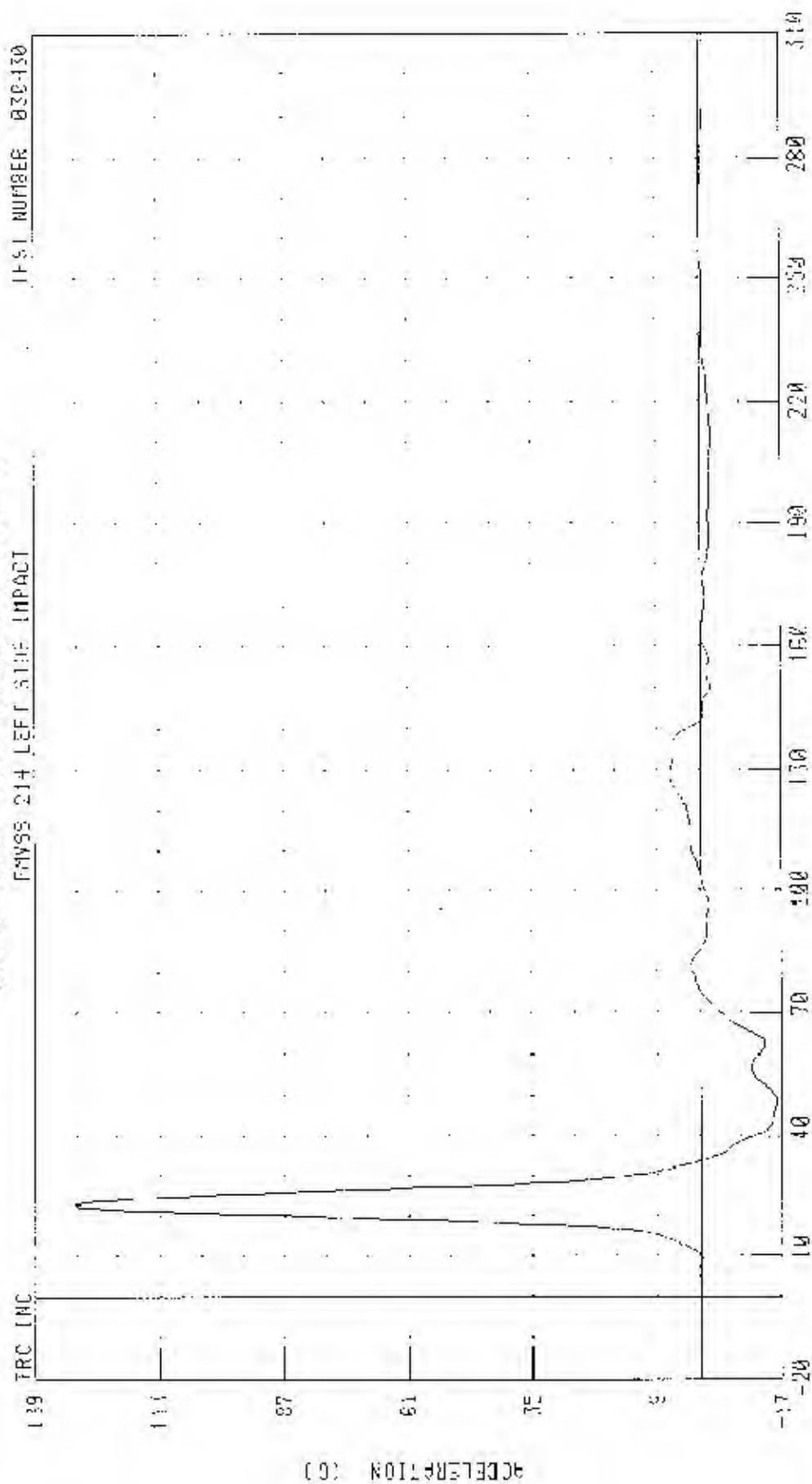
32400

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i

DRIVER SEAT Y AXIS REDUNDANT ACCELERATION

TEST NUMBER 030-130

FMVSS 214 LEFT SIDE IMPACT



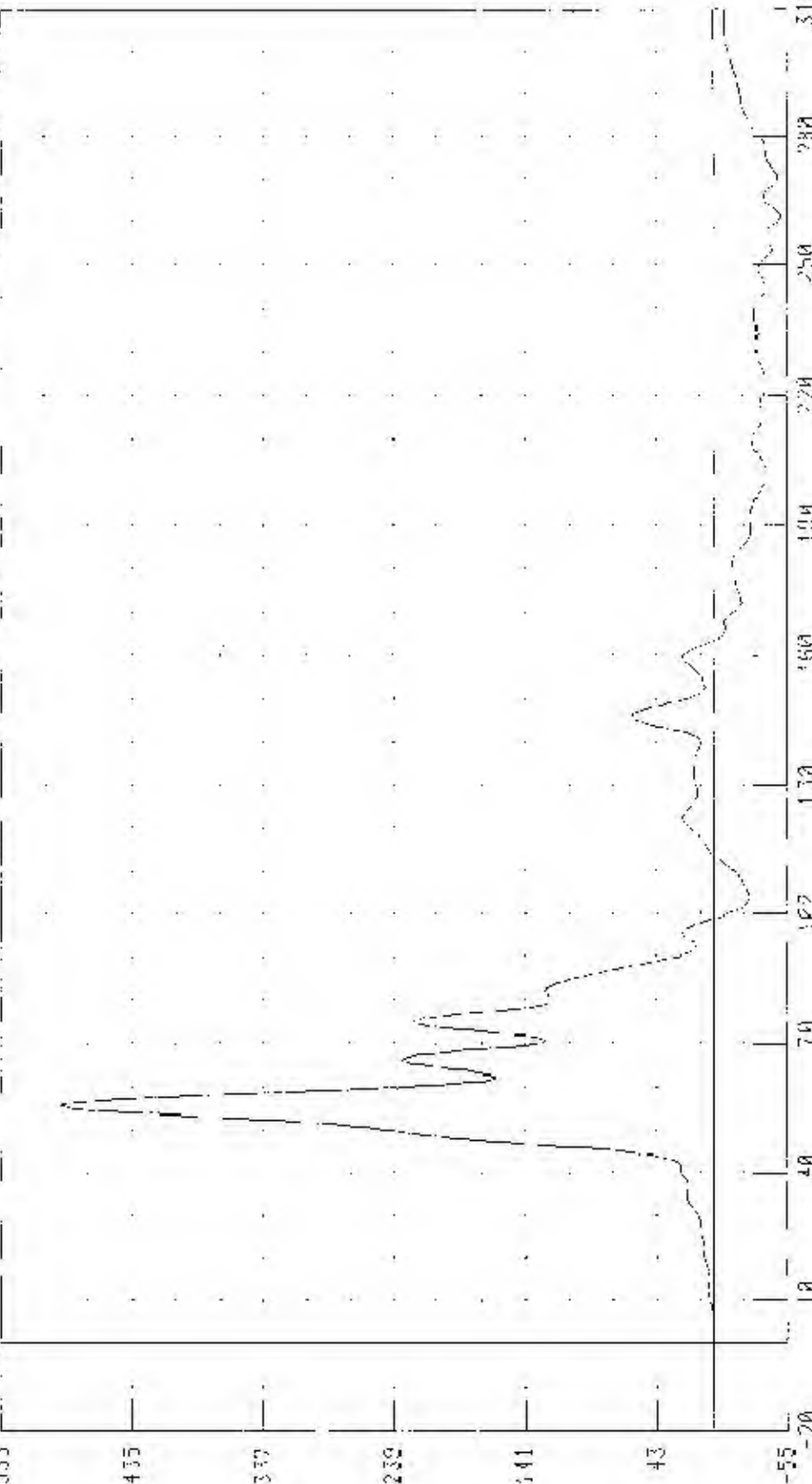
CHANNEL PEV001 FILTER FIR 100

PEAK DATA 138.78 G @ 25.13 MS, 16.41 G @ 48.13 MS

05/28 KPA 4M E602FA SIDE IMPACT (DURING DEFORMABLE PAPER) INTO LEFT SIDE OF 2002 BMW 325I

LEFT REAR PASSENGER UPPER RIR T-CRUS REINFORCEMENT OCCUPATION

180 INCH. 533 435 330 230 141 43 -55



030430 L0824 FILTER: FIR 100

TIME (MS)

PER DATA: 49 81 0 0 15 63 197 10 05 0 0 261 20 108

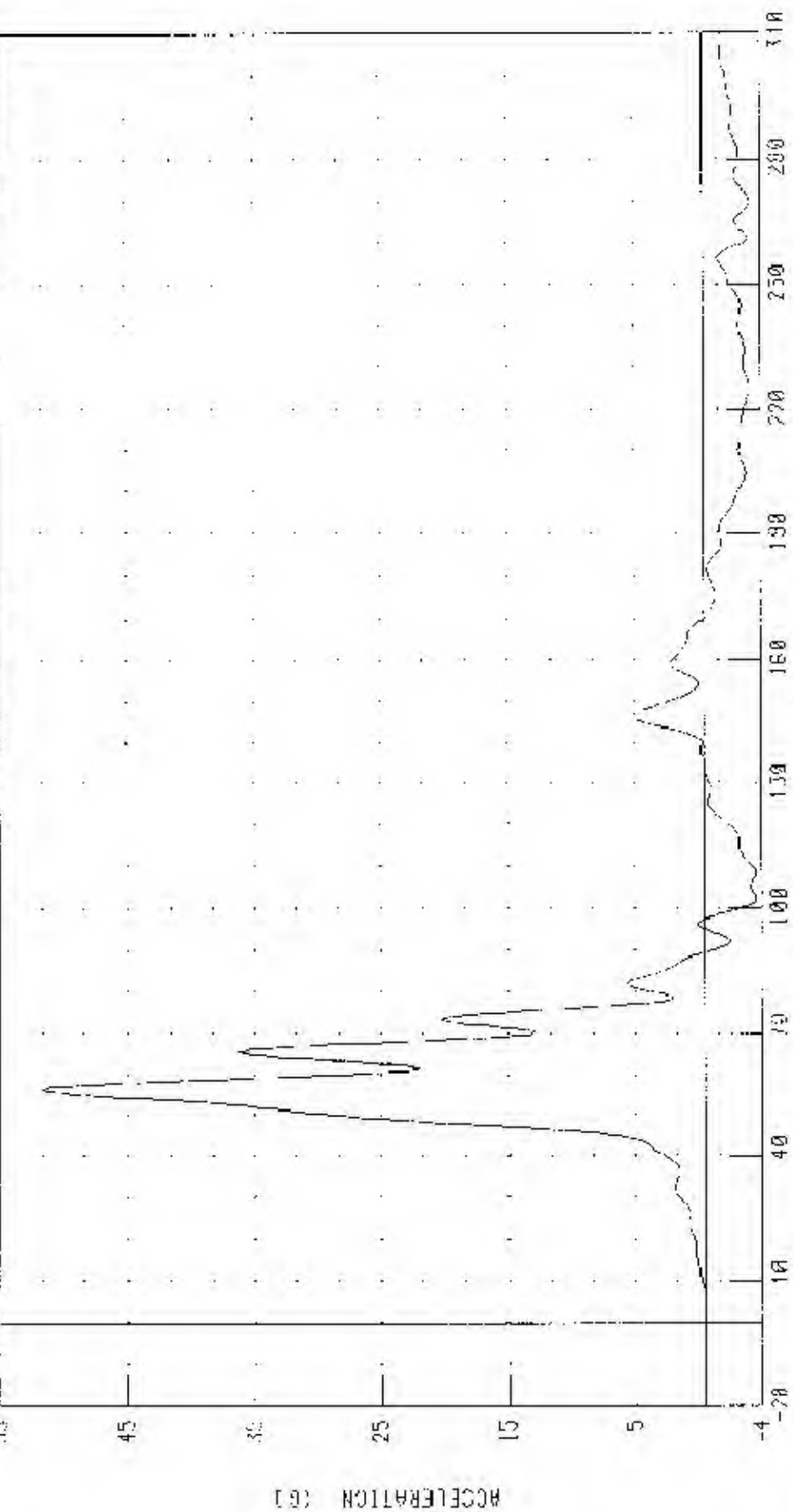
55/26 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2002 BMW 325i

LEFT REAR PASSENGER LOWER RIB 2-AXIS RECURRENT ACCELERATION

55 TPC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030430



CHANNEL LLR234 FILTER 512 102

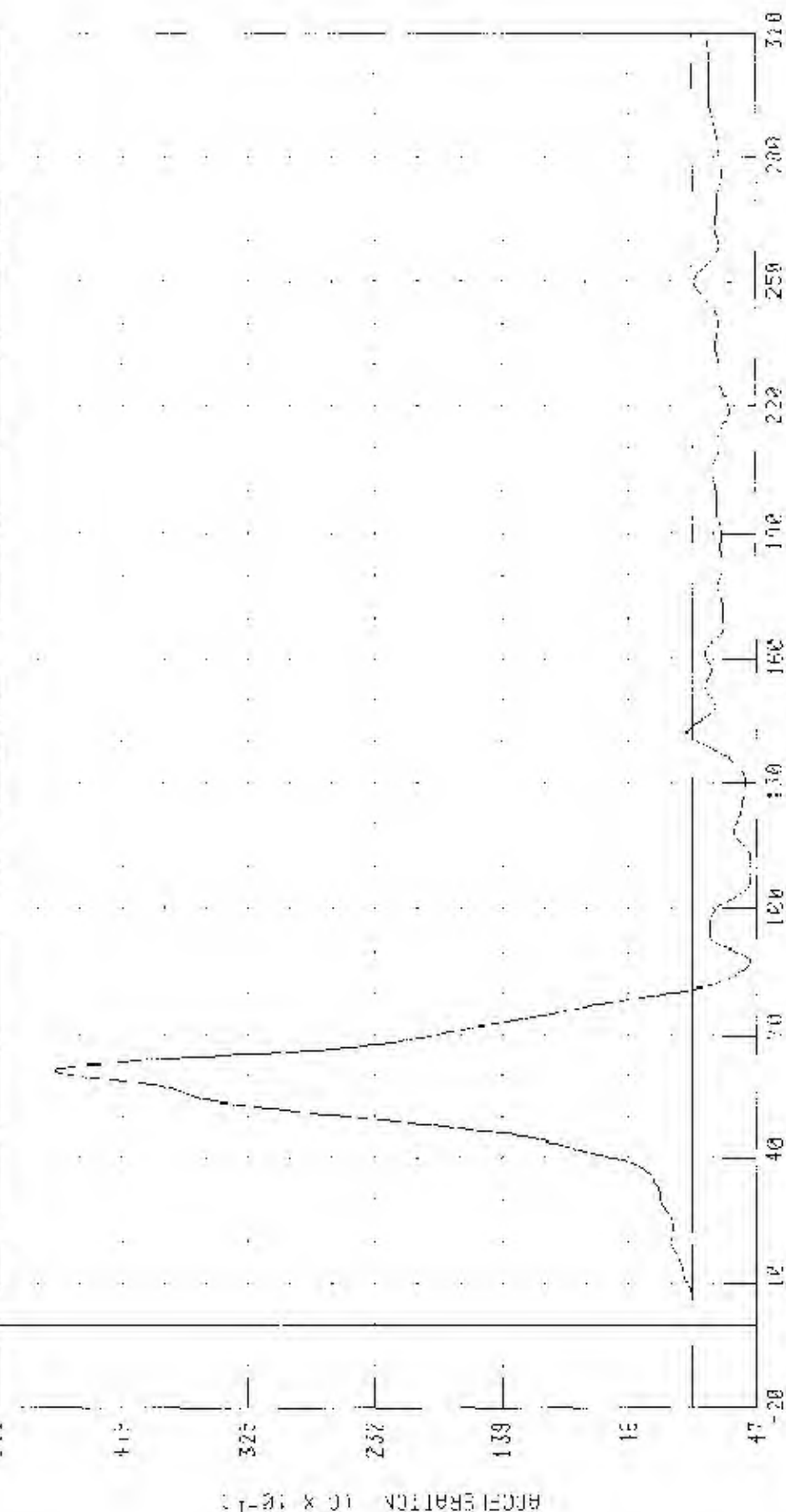
PEAK DATA 52.11 G @ 56.25 MS; -0.11 G @ 182.50 MS

55/23 4P4 DE VEHICLE SIDE IMPACT (MOVING COLUMBIAN BARREL) INTO LEFT SIDE OF 2003 BMW 325I
LEFT REAR PASSENGER LOWER SPINE V-Axis REDUNDANT COLLISION

TEST NUMBER 030430

FIGURE 214 LEFT SIDE IMPACT

TRC INC.



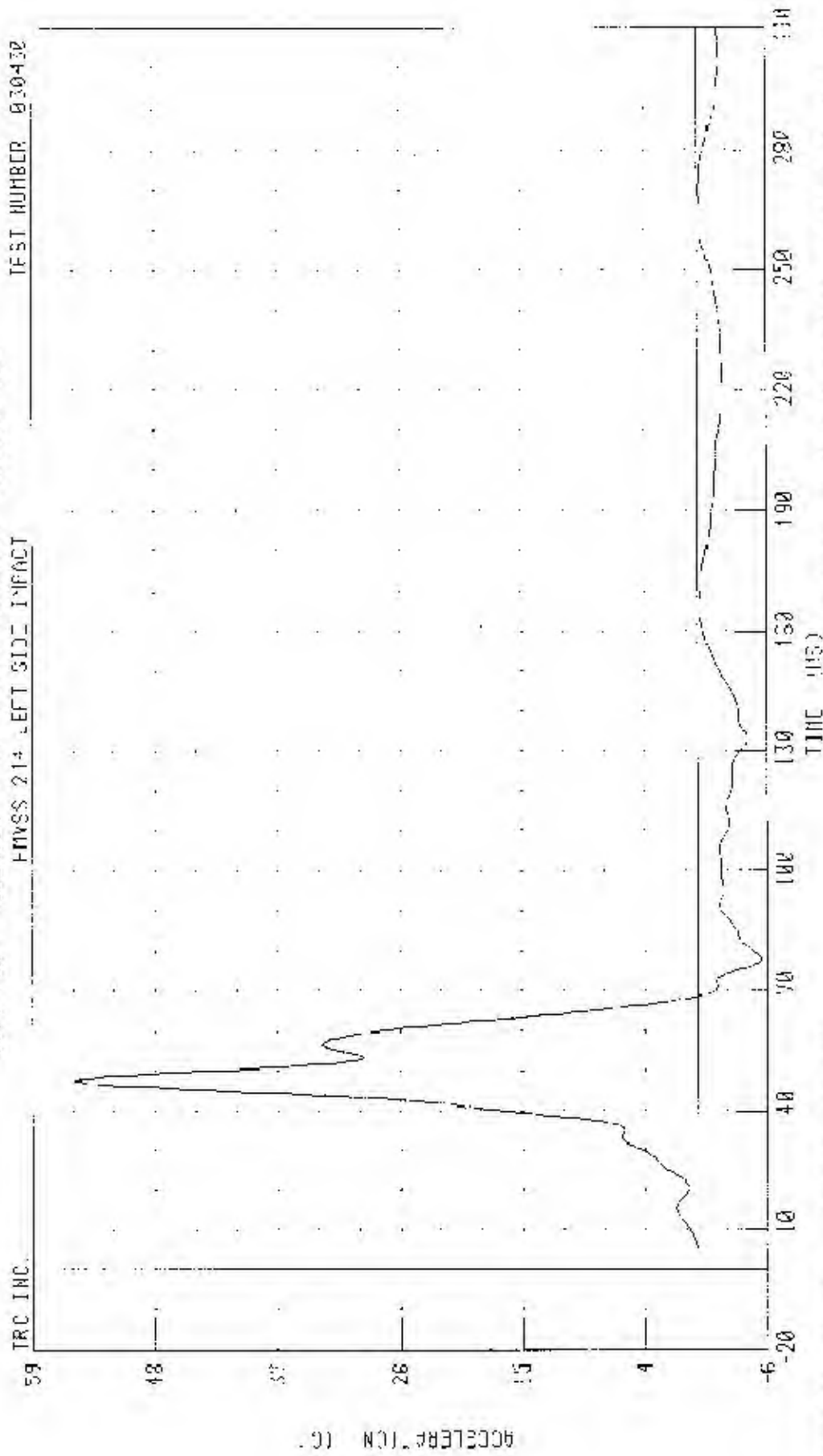
CHANNEL 112144 FILTER FIR 120

2003 BMW 325I 4P4 DE VEHICLE SIDE IMPACT (MOVING COLUMBIAN BARREL) INTO LEFT SIDE OF 2003 BMW 325I

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BMW 325i
LEFT REAR PASSENGER SEAT V15 Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER 030430

FMVSS 214 LEFT SIDE IMPACT



CHANNEL PEYR4 FILTER: 1 K 100

PEAK DATA 55.07 G @ 47.50 MS, -5.67 G @ 281.10 MS

Appendix C

SID Configuration and Performance Verification Data

Summary
SID Pre-Test and Post-Test Calibration
Configured For Left Side Impact

Date: April 16-May 1, 2003 TRC Inc. Test Number: 028C05/C06 & 065C09/C10
 Laboratory Technician: Jack Willeke & Chris Roberts

Test Parameter	Specification	SID 028		SID 065	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH - Seated Height (mm)	889-909	895	895	896	897
RH - Rib Height (mm)	502-520	503	504	510	511
HP - Hip Pivot Height (mm)	99 ref	99.1	99.1	99.1	99.1
RD - Rib from Back Line (mm)	229-241	231	230	239	238
KV - Knee Pivot from Back Line (mm)	511-526	514	512	513	512
KH - Knee Pivot to Floor (mm)	490-505	499	498	500	499
HW - Hip Width (mm)	356-391	372	372	371	371
Thorax Impacts					
Temperature (°C)	18.9-25.5	21.7	21.7	21.1	22.2
Relative Humidity (%)	10-70	32.0	43.0	26.0	43.0
Probe Speed (m/s)	4.27-4.33	4.29	4.29	4.25	4.31
Upper Rib (g's)	37-46	42.0	40.0	40.2	44.5
Lower Rib (g's)	37-46	41.4	42.6	39.1	43.9
Lower Spine (g's)	15-22	17.5	17.5	20.1	21.0
Pelvis Impacts					
Temperature (°C)	18.9-25.5	22.2	21.7	21.1	22.2
Relative Humidity (%)	10-70	41.0	43.0	25.0	43.0
Probe Speed (m/s)	4.27-4.33	4.30	4.29	4.26	4.28
Pelvis (g's)	40-60	48.4	47.6	50.9	54.5

Calibration Test Results

Pre-Test

SID: 028

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements (tested on February 3, 2003 for a previous calibration series).
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.

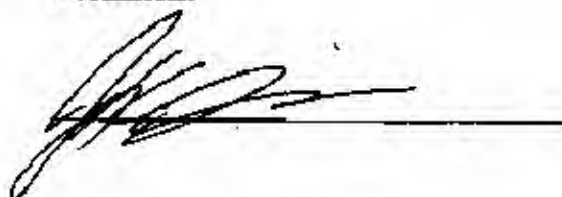
572F SID Dummy

External Dimensions

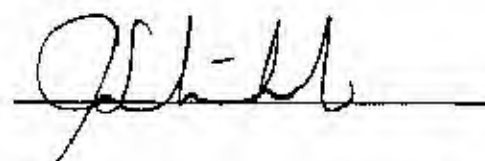
Serial No. 028 Calibration No. 05

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	895 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	503 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	231 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	514 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	499 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	372 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	171 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	170 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		≤ 2.5 mm	1.0 mm	Yes

Technician



Approved



TTC

TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

SID/HIII DUMMY

16-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL02805

572M SID/HIII SN028 HEAD CAL05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	22.22 deg. C
RELATIVE HUMIDITY	10 - 70 %	41.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	149.76 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-9.66 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042803.0635;1

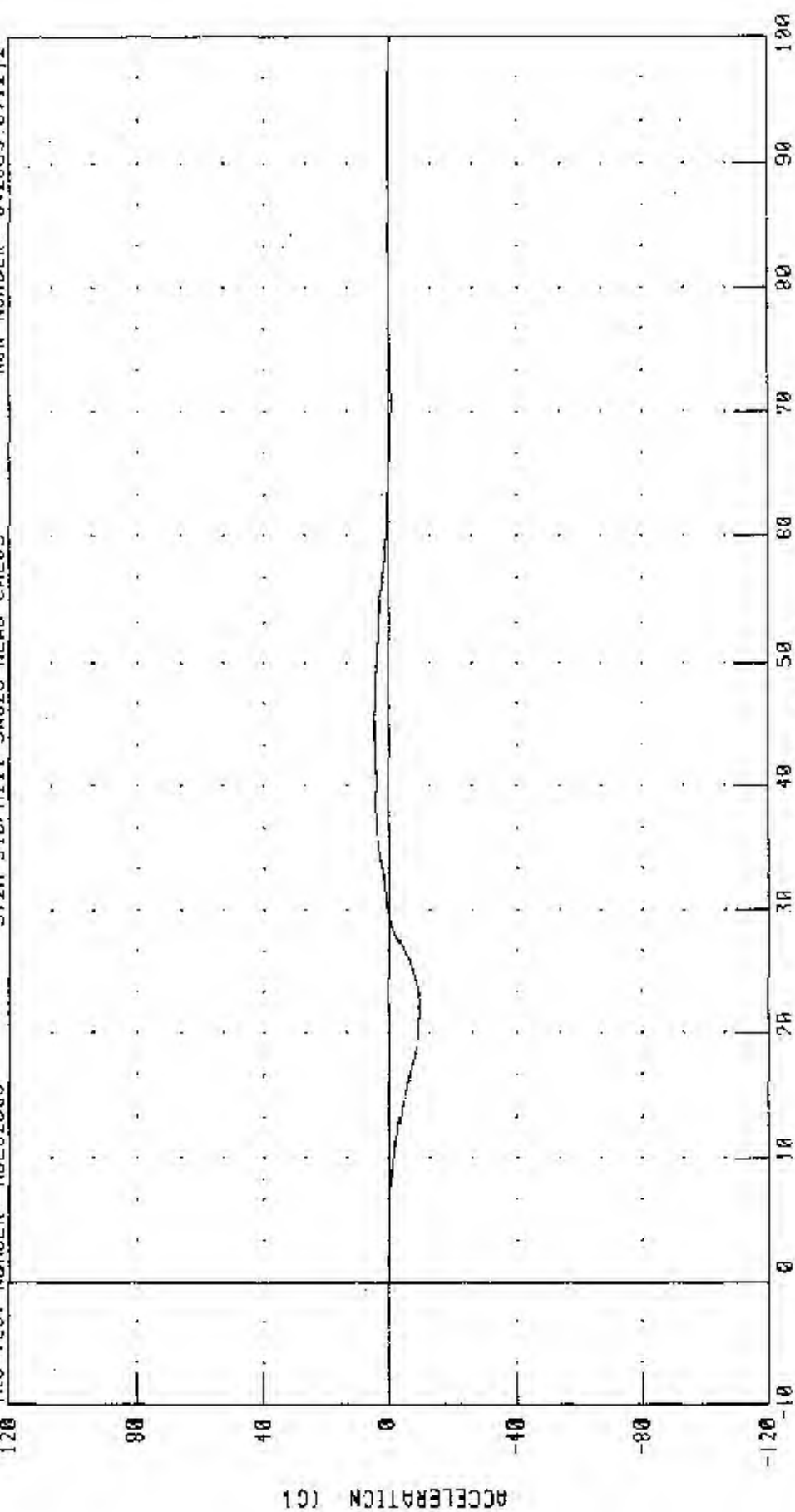
572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL02805

572M SID/HILL SN028 HEAD CAL05

RUN NUMBER: 042803 0712.2



CHANNEL: HDXG FILTER: CH. CLASS 1000

PEAK DATA: 4 71 0 0 1 48 MS; -9 66 0 0 2.24 MS

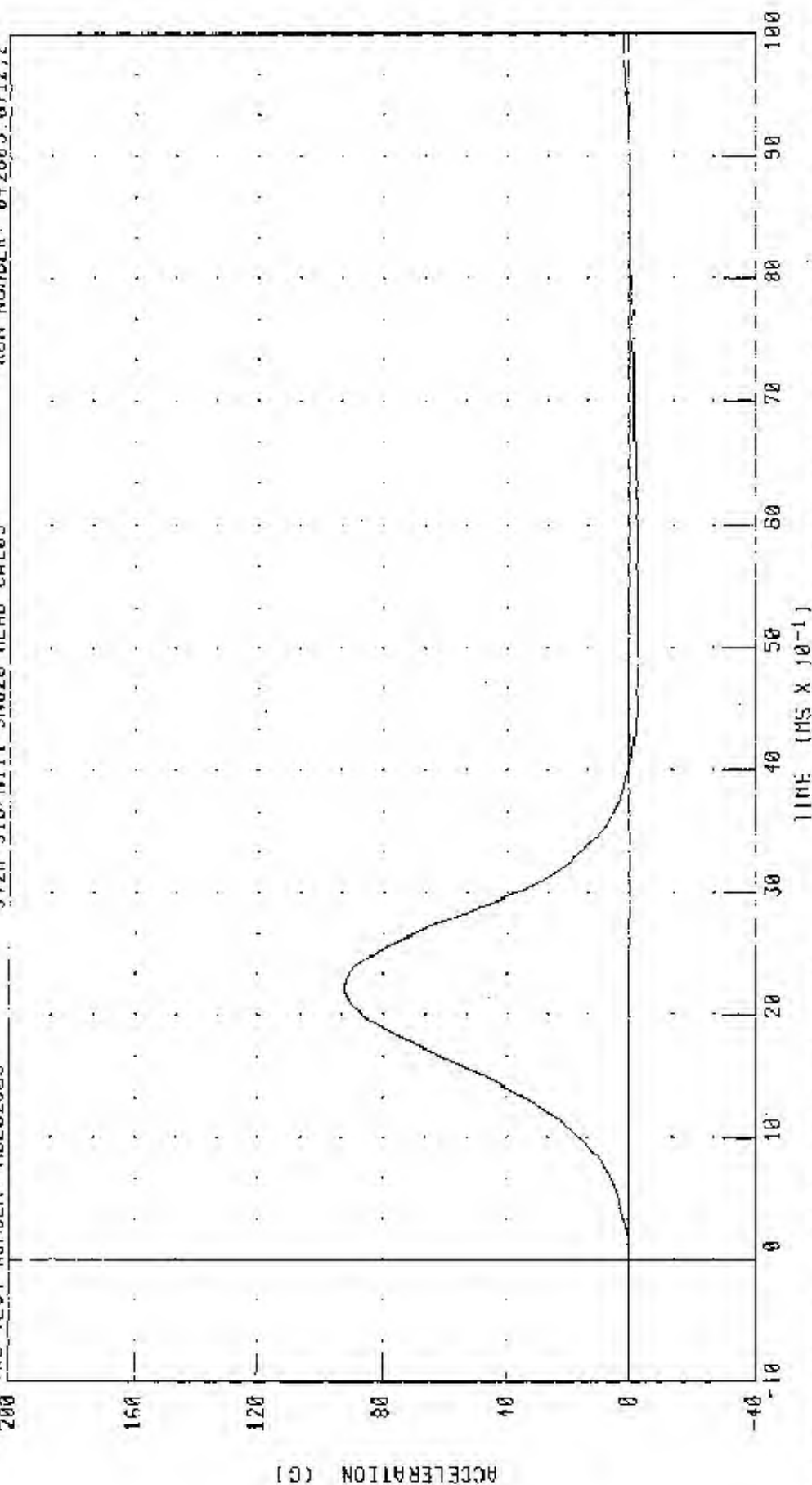
572M S10/H111 DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HDL02805

572M S10/H111 SMO28 HEAD CAL05

RUN NUMBER: 042803 071212



CHANNEL: HDY06 FILTER: CH CLASS 1000

PEAK DATA: 92.37 G @ 2.24 MS; -2.74 G @ 4.88 MS

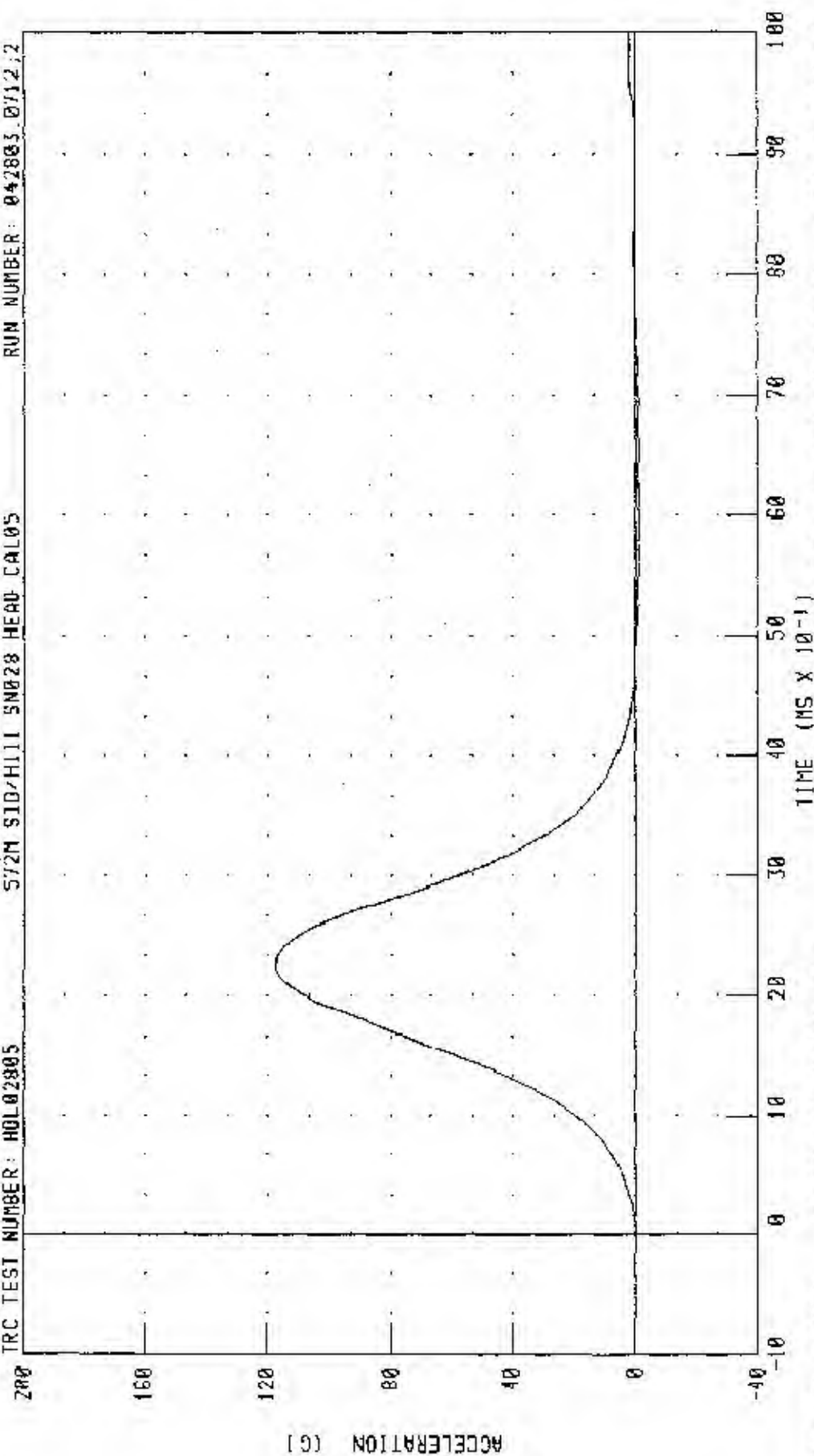
572M SID/HILL DUNNY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: H0102805

572M SID/HILL SN028 HEAD CAL05

RUN NUMBER: 042803 0712.2



CHANNEL: HEADZG FILTER: CH. CLASS 1000

PEAK DATA: 117.48 G @ 2.24 MS; -1.52 G @ 5.92 MS

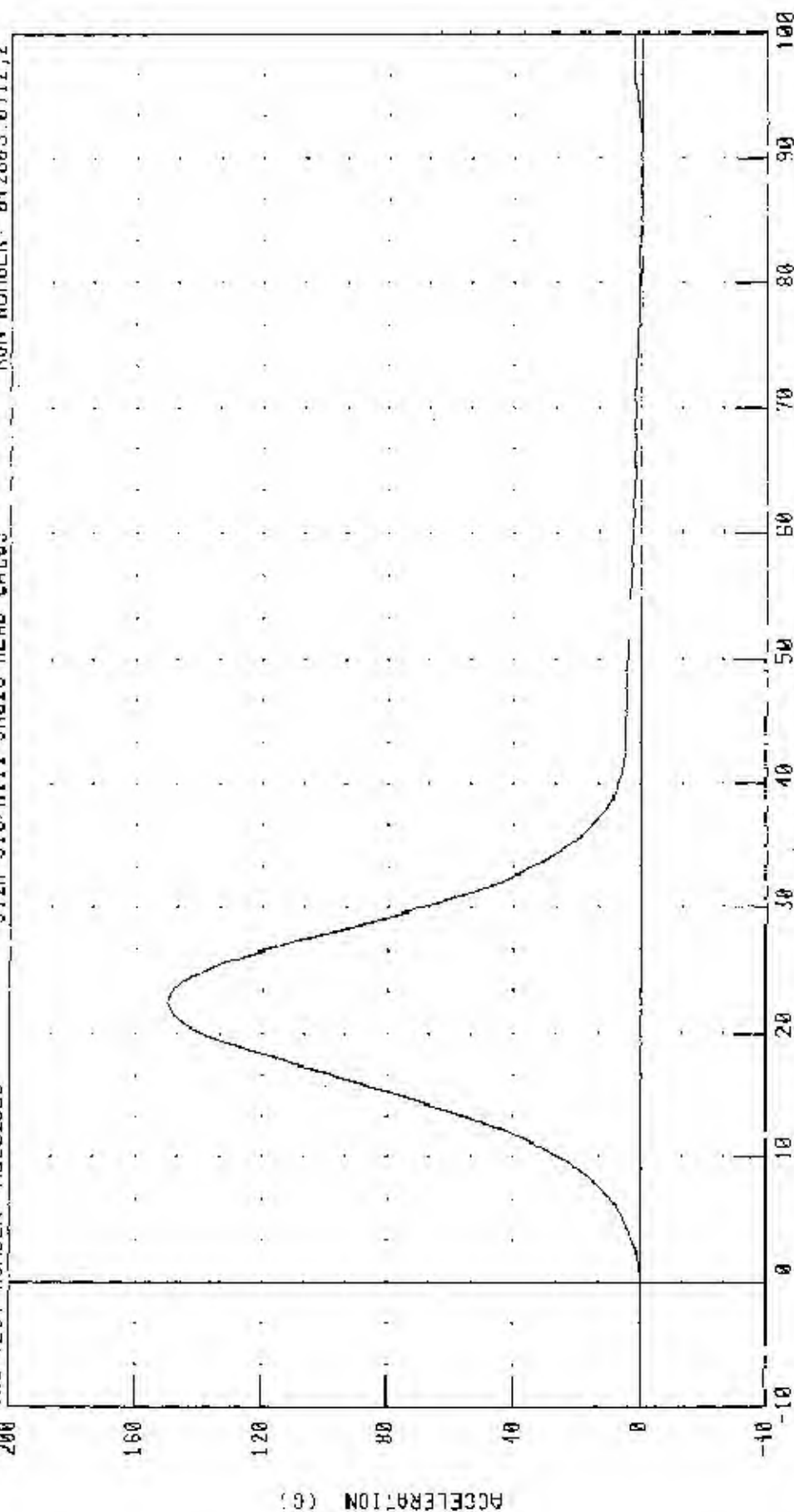
572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HDL02805

572M SID/HILL SN028 HEAD CAL05

RUN NUMBER: 012803.0712,2



TIME (MS X 10⁻¹)

CHANNEL: HEADG FILTER: CH CLASS 1000

PEAK DATA: 149.76 G @ 24 MS; 0.02 G @ 0.64 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

17-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

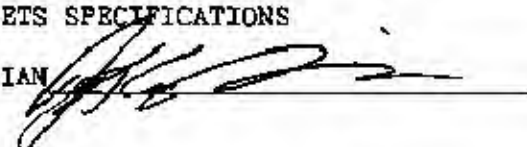
TEST NO. NFL02805

H3/SID SN028 NECK LEFT CAL05

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.11 deg. C
RELATIVE HUMIDITY		10 - 70 %	41.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.44 M/S
	20 MS	4.12 - 5.10 M/S	4.88 M/S
	30 MS	5.73 - 7.01 M/S	6.88 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.12 - 7.18 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	71.05 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	61.20 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	78.66 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	54.24 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.32 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041703.1527;1

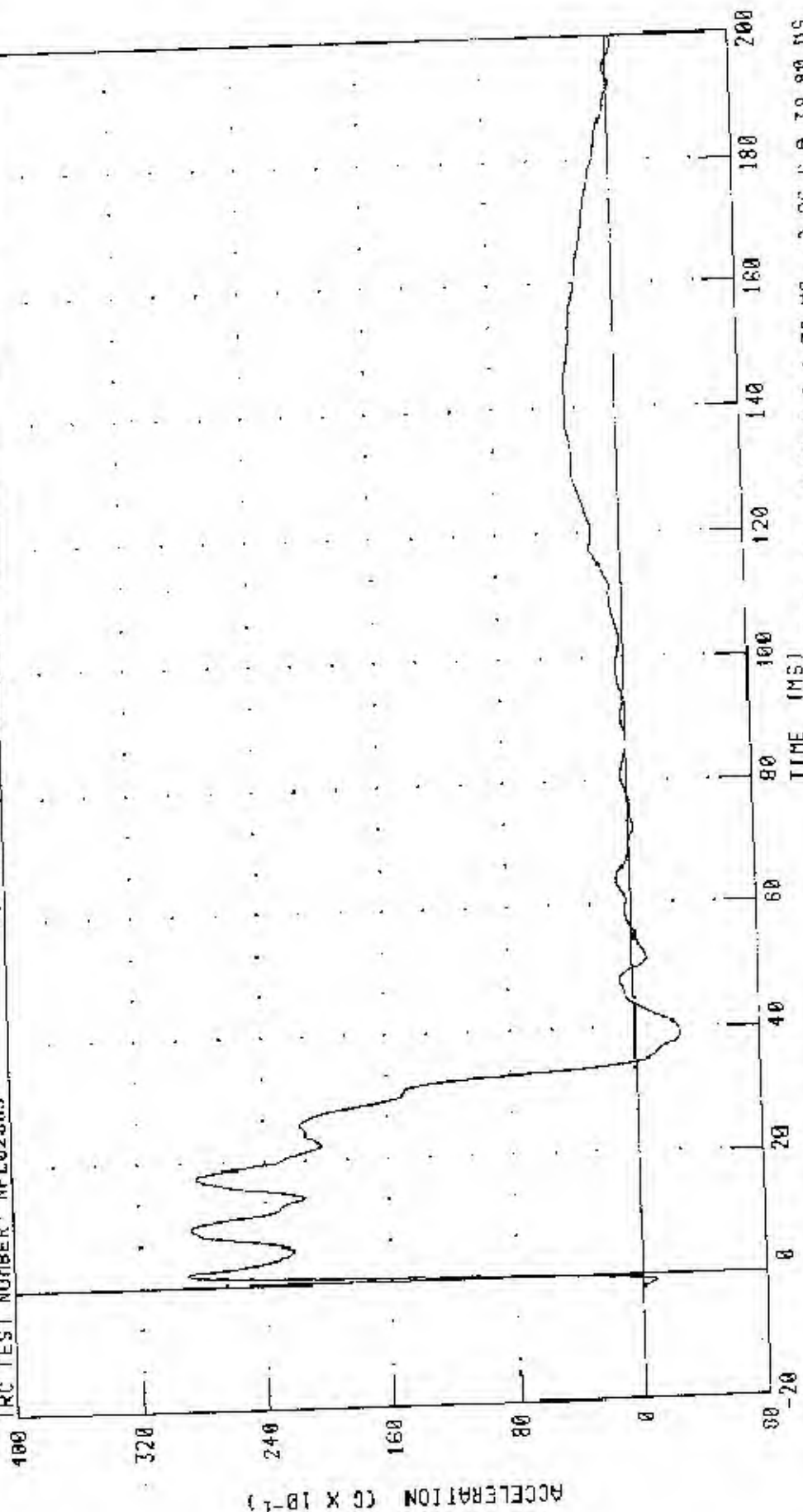
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

RUN NUMBER: 041703.1530.1

H3/SID SW028 NECK LEFT CAL05

TRC TEST NUMBER: NFL028R5



PEAK DATA: 29.86 G @ 1.76 MS, -2.95 G @ 38.80 MS

CHANNEL: PENXC FILTER: CH1 CLASS 180

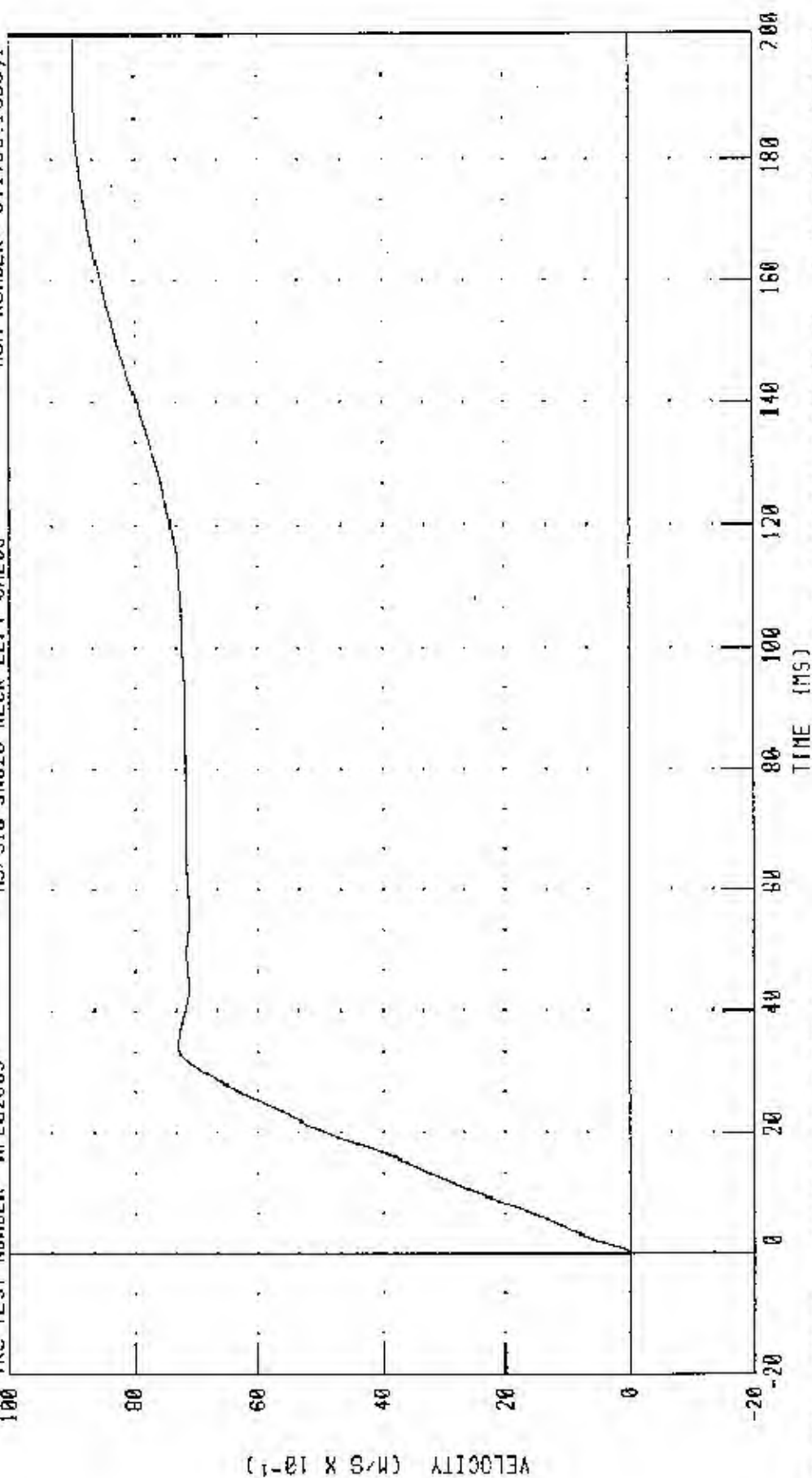
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER NFL02805

H3/SID SN028 NECK LEFT CAL05

RUN NUMBER: 041703.1530;1



CHANNEL: PENNYI FILTER CH CLASS 180

PEAK DATA: 8 99 M/S @ 196.08 MS. -0.01 M/S @ -0.56 MS

H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

RUN NUMBER: 041703.1530.1

TRC TEST NUMBER: NFL02805

H3/SID SNO28 NECK LEFT CAL05

120

90

60

30

0

-30

-60

200

TIME (MS)

PEAK DATA: 25.85 ° @ 61.20 MS, -12.35 ° @ 150.80 MS

CHANNEL: BETA FILTER: GIL CLASS 60

ANGLE (°)

C-13

030430

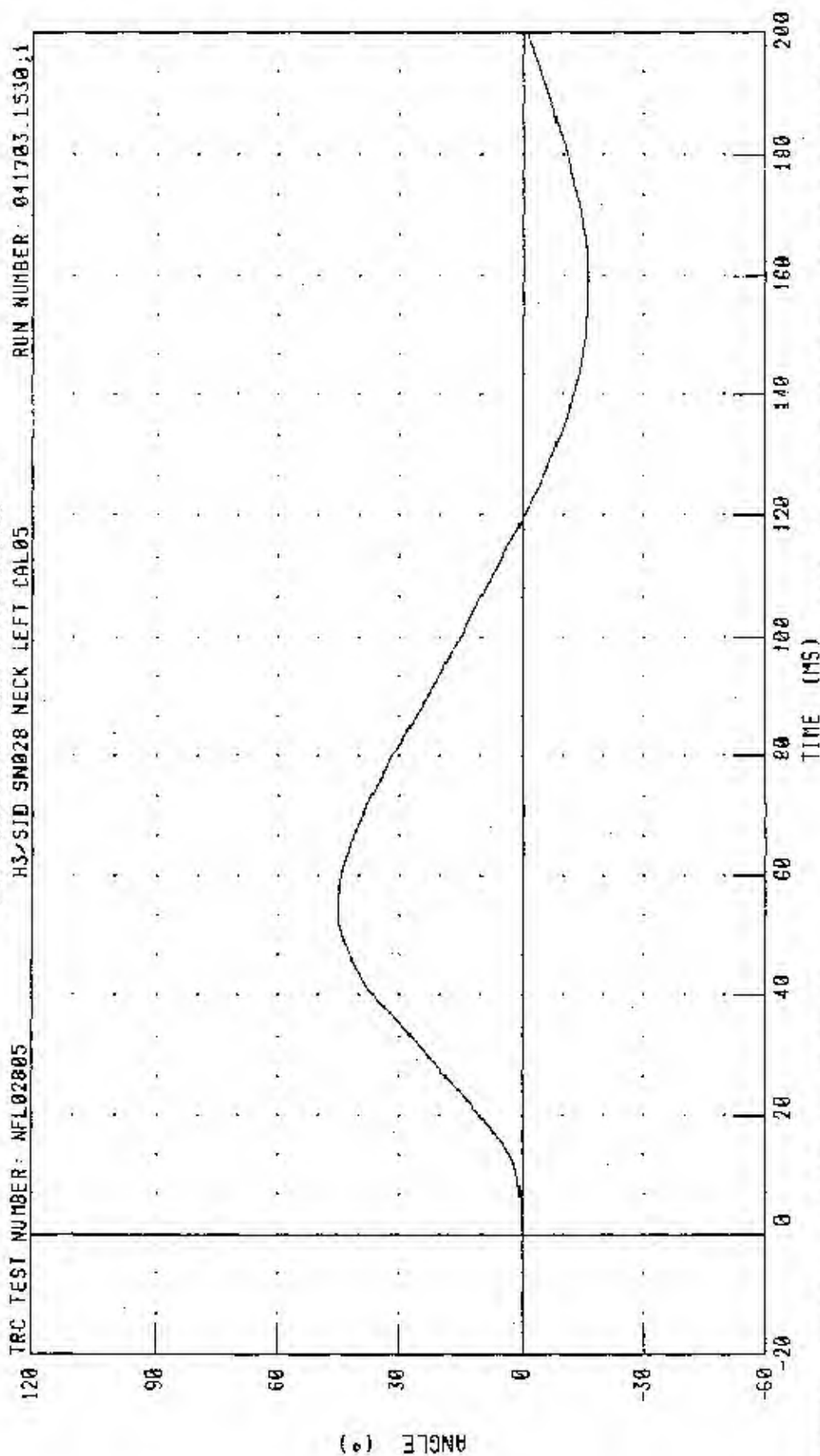
H3/STD DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL02805

H3/STD SN028 NECK LEFT CAL05

RUN NUMBER: 041703.1530.1



CHANNEL: THETA FILTER: CII CLASS 60

PEAK DATA: 45.47 ° @ 54.40 MS, -16.40 ° @ 157.52 MS

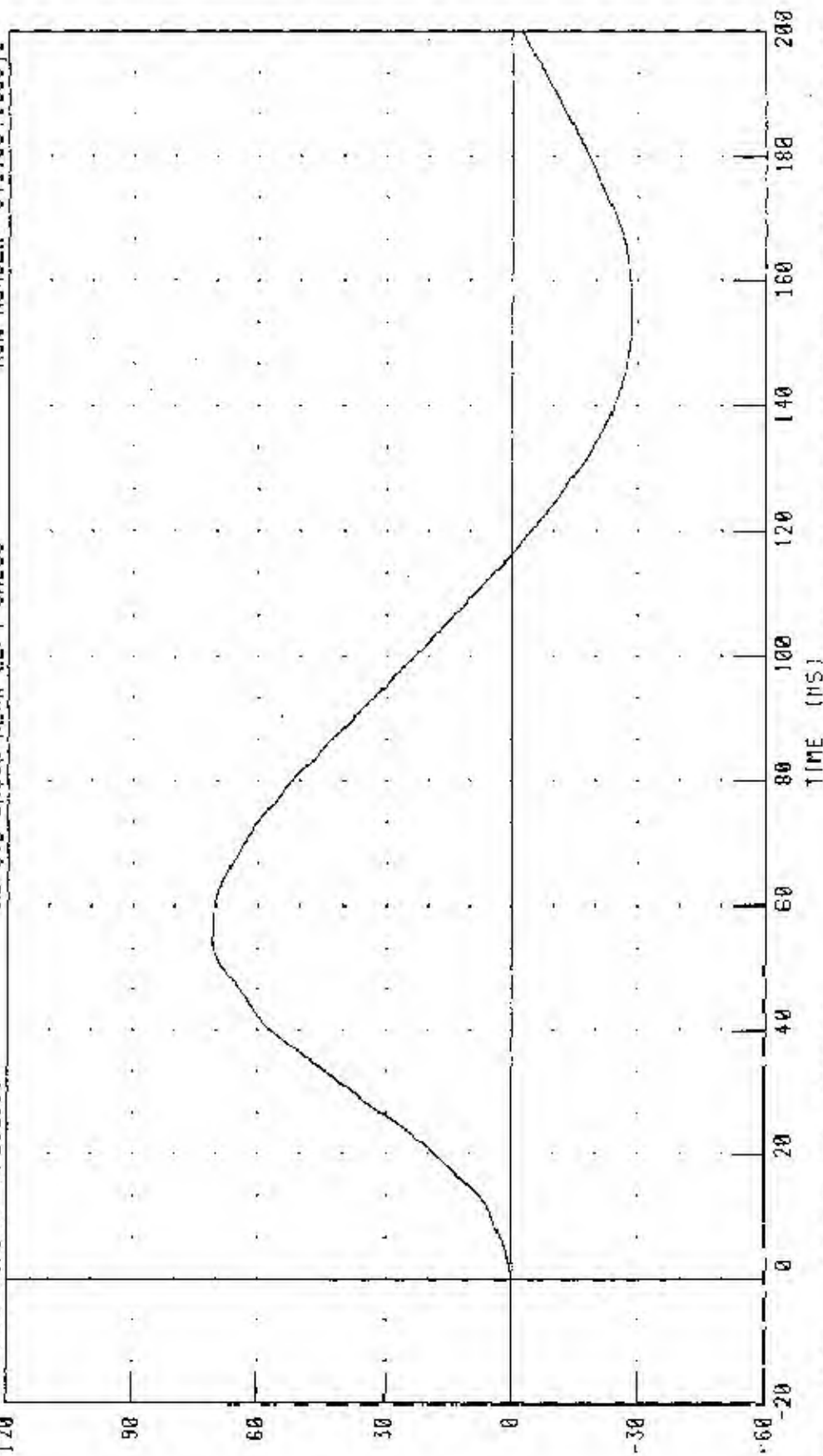
H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

IRC TEST NUMBER: NFL02805

H3/S10 SN028 NECK LEFT CAL05

RUN NUMBER: 041703.1530.1



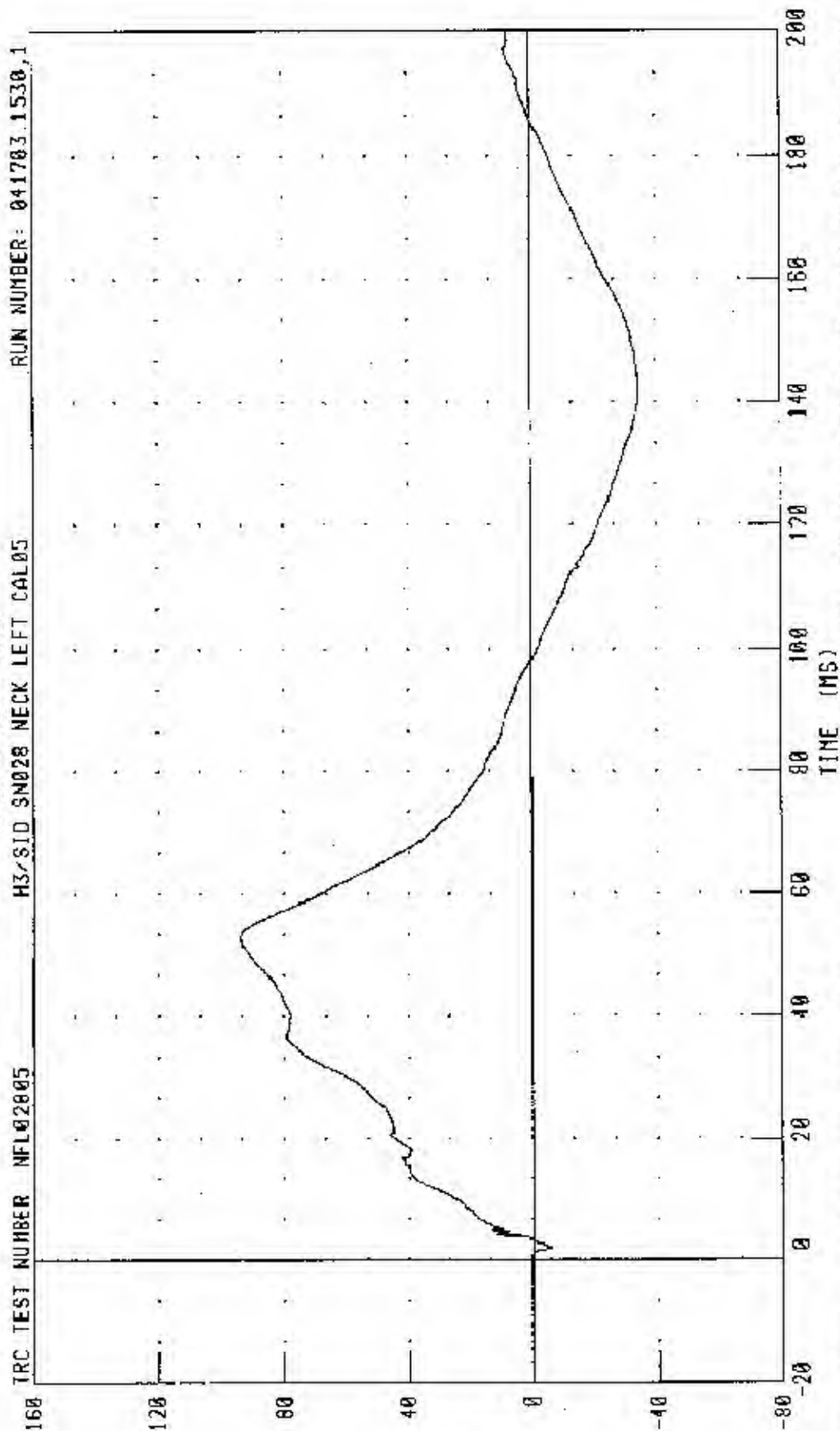
PEAK DATA: 71.05 ° @ 55.20 MS; -20.55 ° @ 154.72 MS

CHANNEL: TOTAL FILTER: CH CLASS C0

H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER NFL02805 H3/SID SN028 NECK LEFT CAL05 RUN NUMBER: 041703.1530.1



PEAK DATA: 937.92 N @ 52.88 MS; -344.45 N @ 141.36 MS

CHANNEL: NEKYF FILTER: CH CLASS 1800

FORCE (N X 10^5)

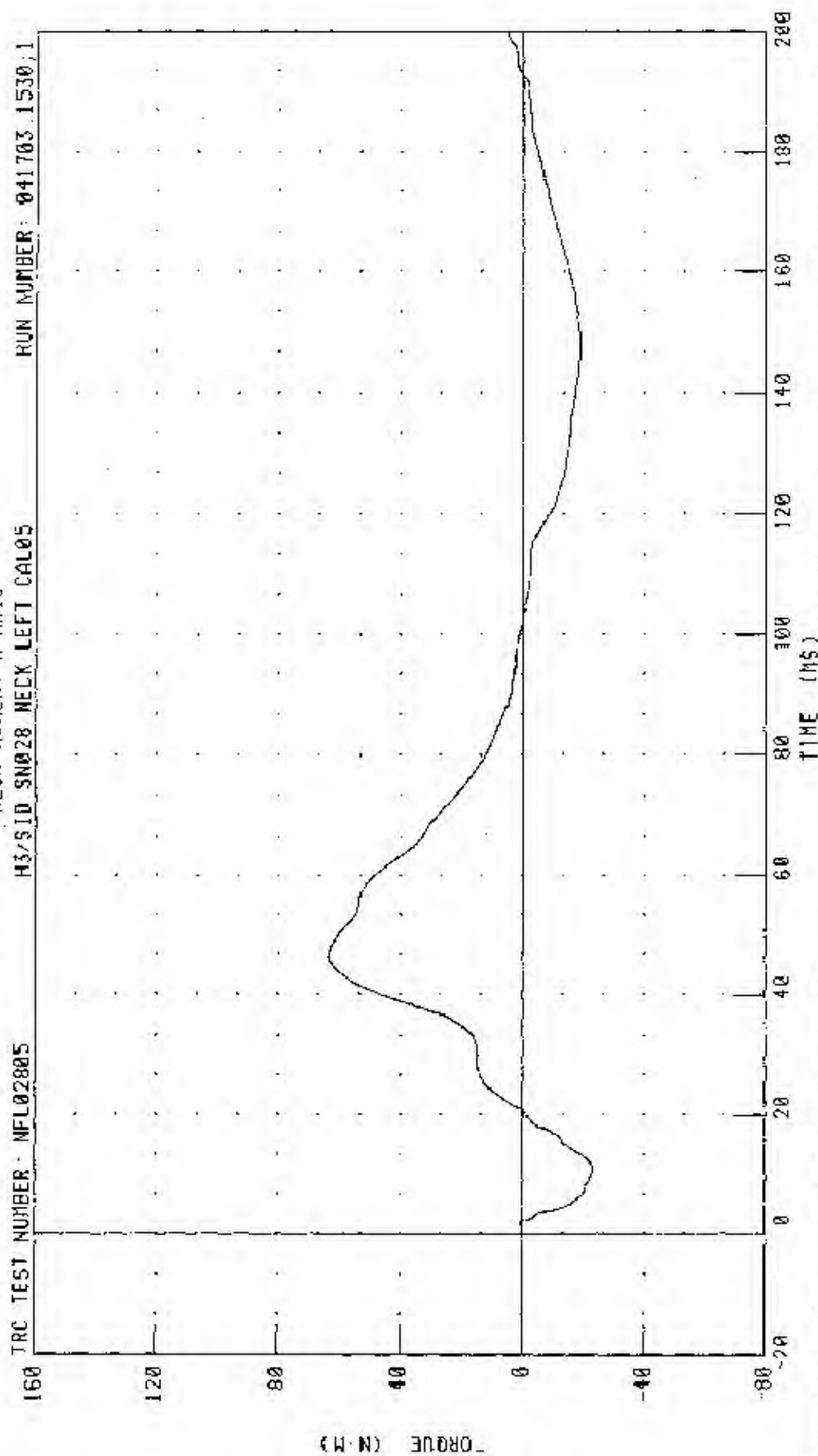
H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NPL02805

H3/SID SN028 NECK LEFT CAL05

RUN NUMBER: 041703.1530.1



CHANNEL: NCKXH

FILTER: CII, CLASS 600

TIME (ms)

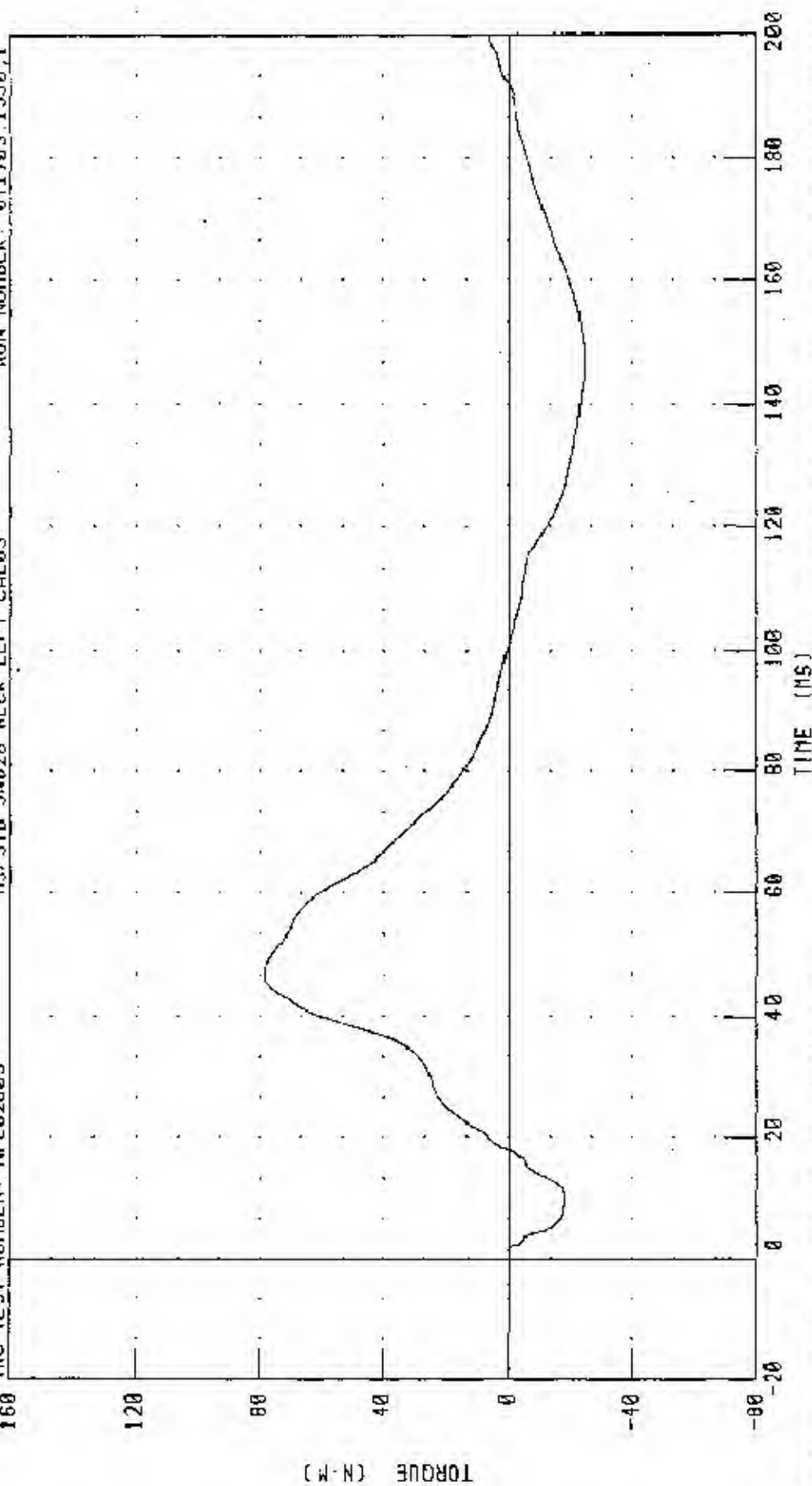
PEAK DATA: 63.59 N.M @ 45.64 MS, -22.90 N.M @ 10.80 MS

H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL02805

H3/SID SN028 NECK LEFT CAL05

RUN NUMBER: 041703 1530.1



CHANNEL: NEKOM FILTER: CH. CLASS 600

PEAK DATA: 78.66 N-M @ 46.88 MS; -24.65 N-M @ 145.92 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

28-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL02805A

572F SID SN028 L.THORAX CAL05

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	32.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.29 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	42.0 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	41.4 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	17.5 G

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042803.1314;1

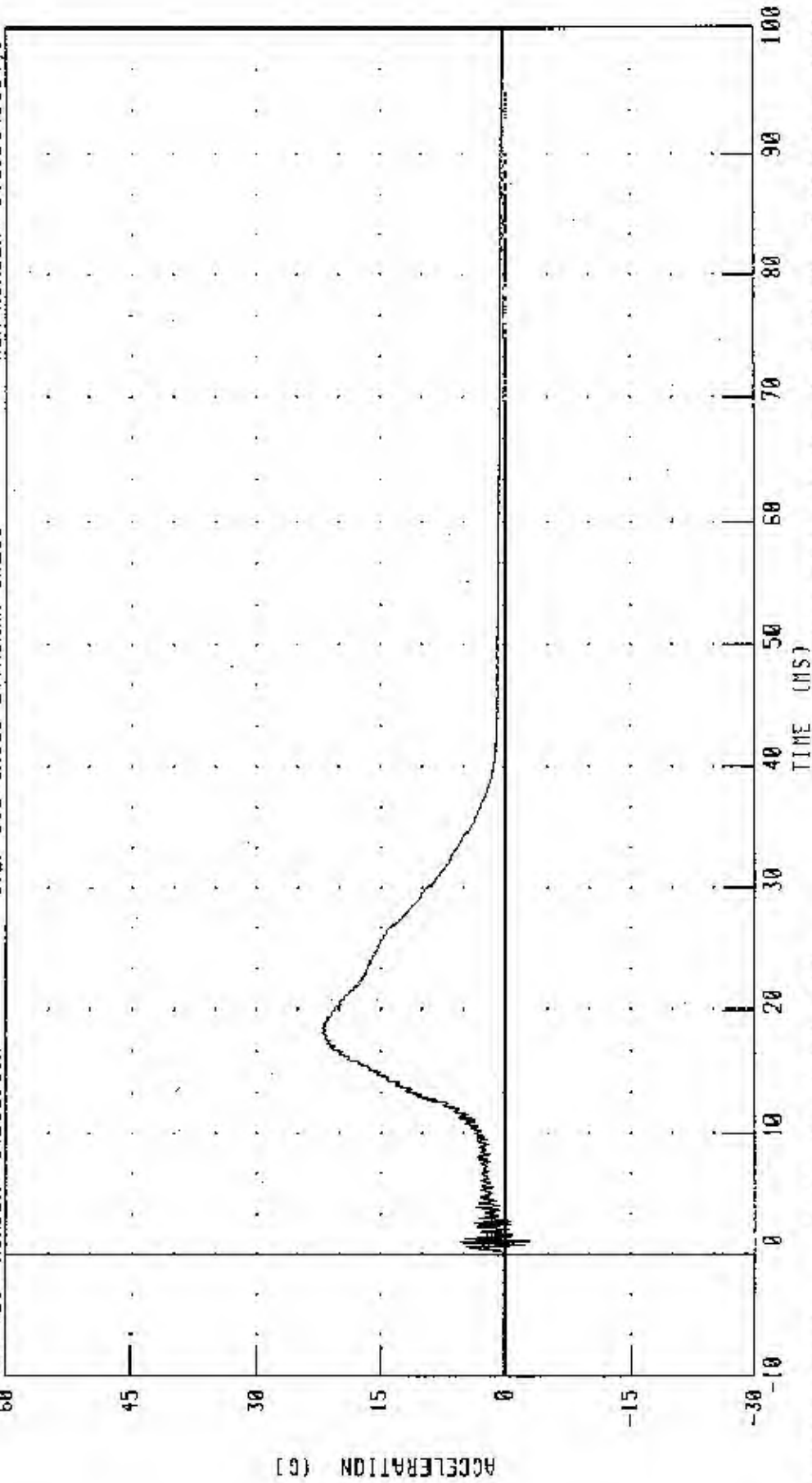
PART 572-F S I D THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENOVULUM DECELERATION

IRC TEST NUMBER: S1L02805A

572F SID SN028 L THORAX CAL05

RUN NUMBER: 042803.1314.1



CHANNEL: PENXC FILTER: CH, CLASS 1000

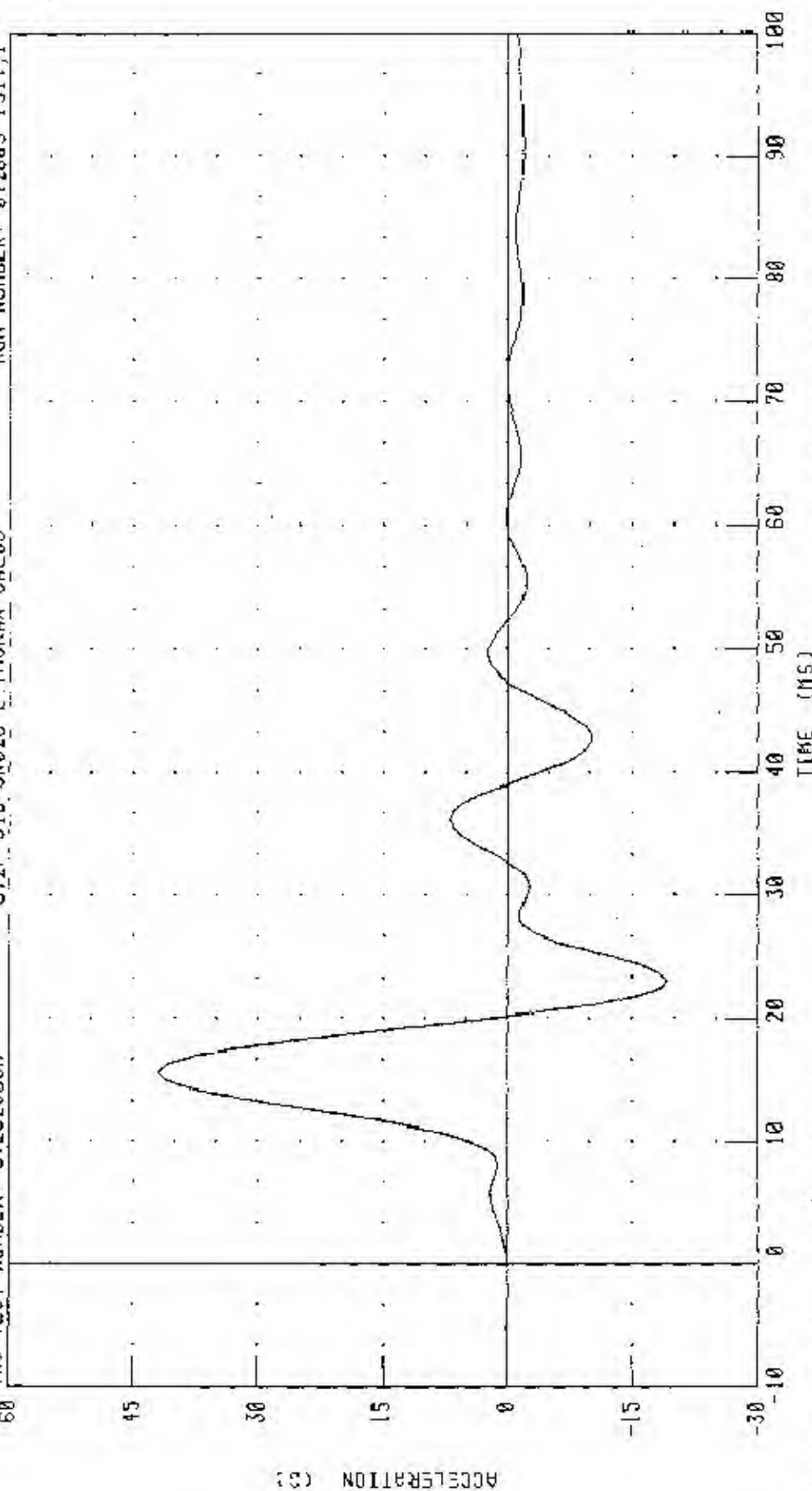
PEAK DATA: 22.09 G @ 18.16 MS, -2.96 G @ 1.12 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: 51L02805A

572F S10 SN028 L THORAX CAL05

RUN NUMBER: 042803 1314,1



CHANNEL: LURYG FILTER: FIR 100

PEAK DATA: 42.24 G @ 15.63 MS, -19.19 G @ 25.13 MS

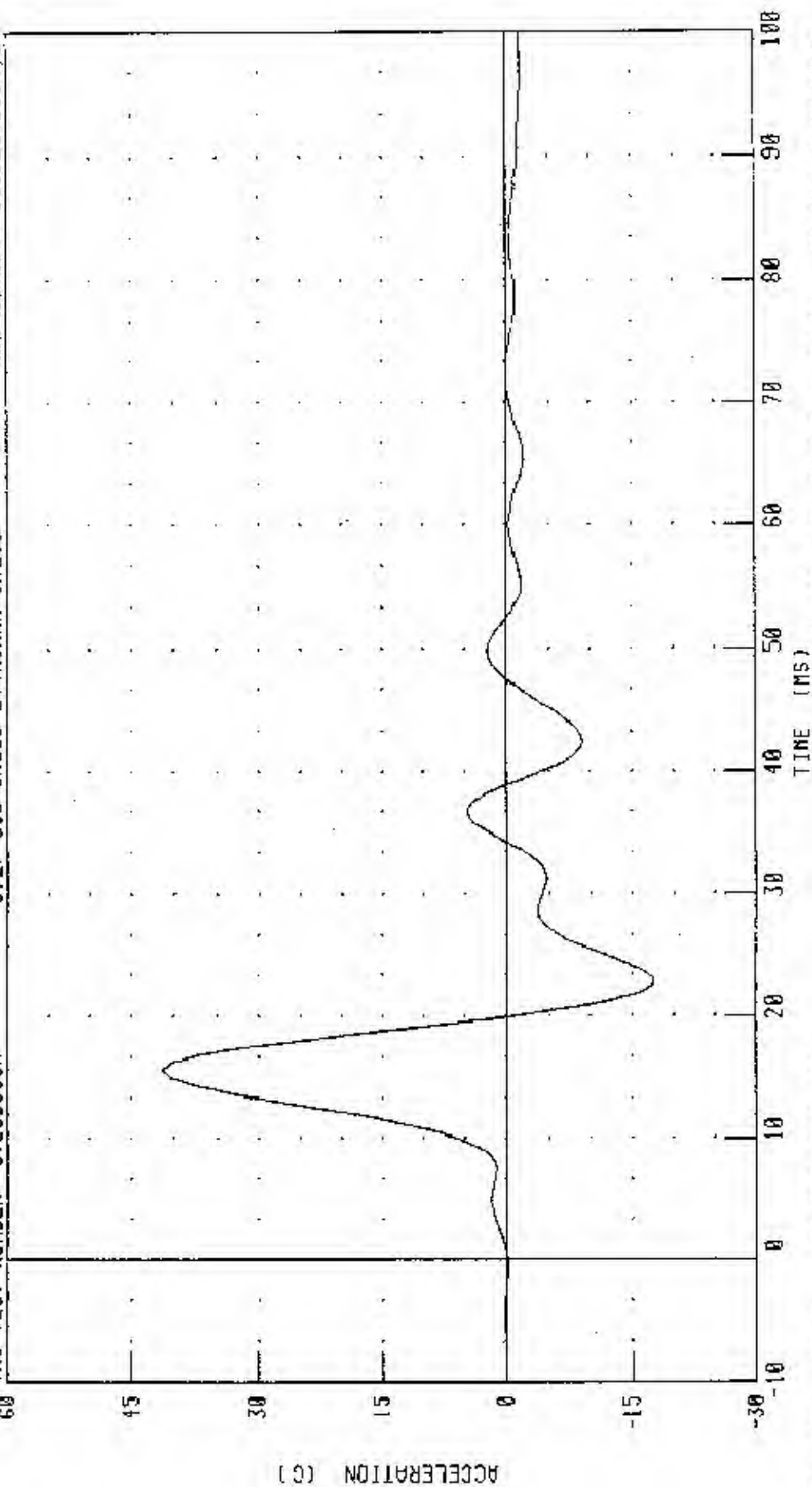
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: SIL02805A

572F SID SNO28 L THORAX CAL05

RUN NUMBER - 042803.1314.1



CHANNEL: LLYG FILTER: FIR 100

PEAK DATA: 41.36 G @ 15.83 MS; 17.47 G @ 22.58 MS

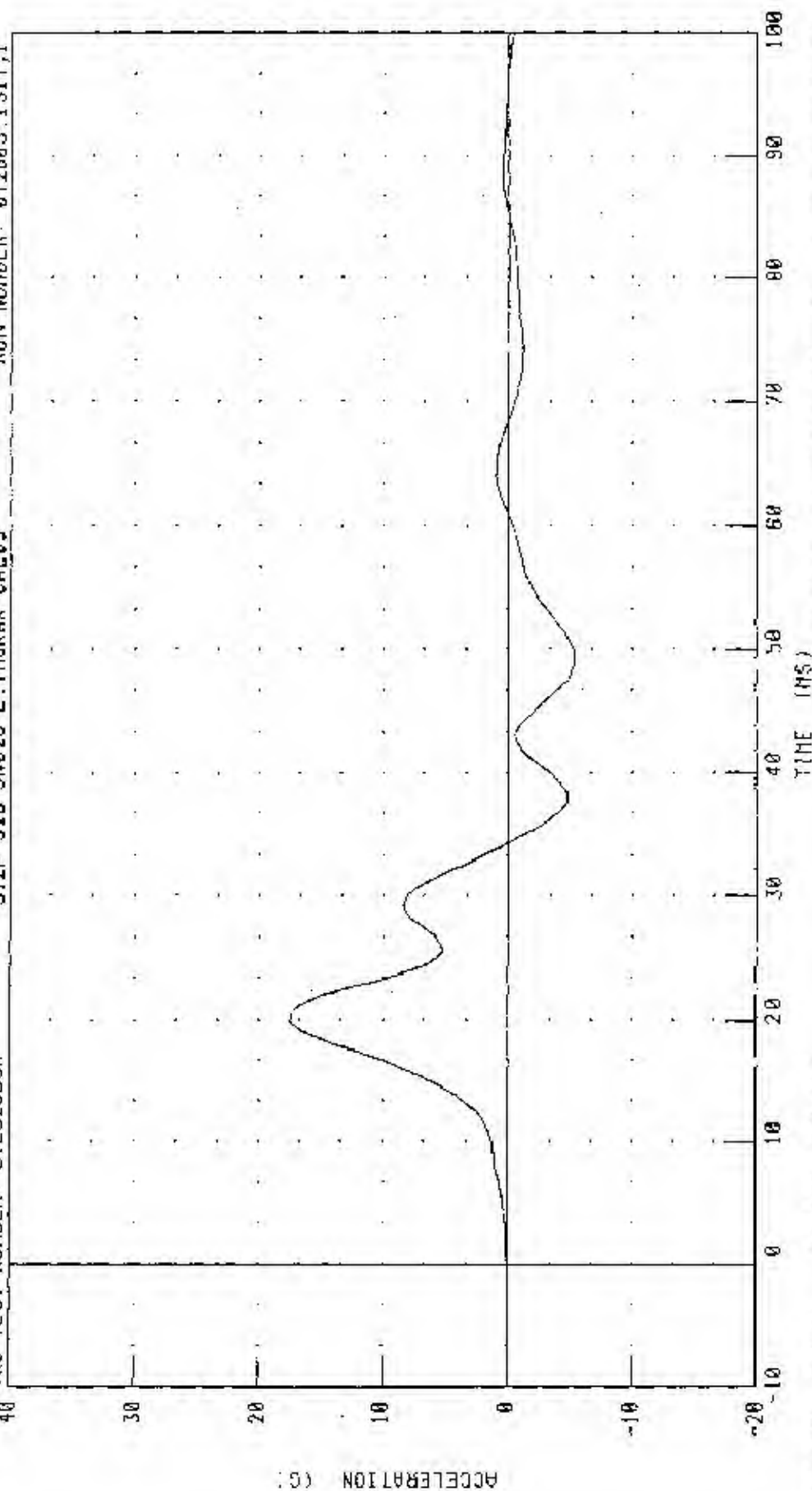
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL02805A

572F SID SN028 L THORAX CAL05

RUN NUMBER: 042803.1314.1



PEAK DATA: 17.46 G @ 20.00 MS, .529 G @ 49.37 MS

CHANNEL: T12YC FILTER: F100

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

03-FEB-03

TRC INC.

572F SNC28 DAMPER TEST CAL01

TEST NUMBERS: DP02801A,DP02801B,DP02801C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	46.0 %
VELOCITY	FORCE	667 - 925 N	750 N
2.69 M/S	DISPLACEMENT	29.7 - 34.5 MM	29.9 MM
VELOCITY	FORCE	1733 - 2100 N	1791 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	34.9 MM
VELOCITY	FORCE	3784 - 4495 N	4259 N
6.12 M/S	DISPLACEMENT	33.3 - 39.6 MM	37.8 MM

DAMPER SETTING = 5.6

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 020303.1116;2

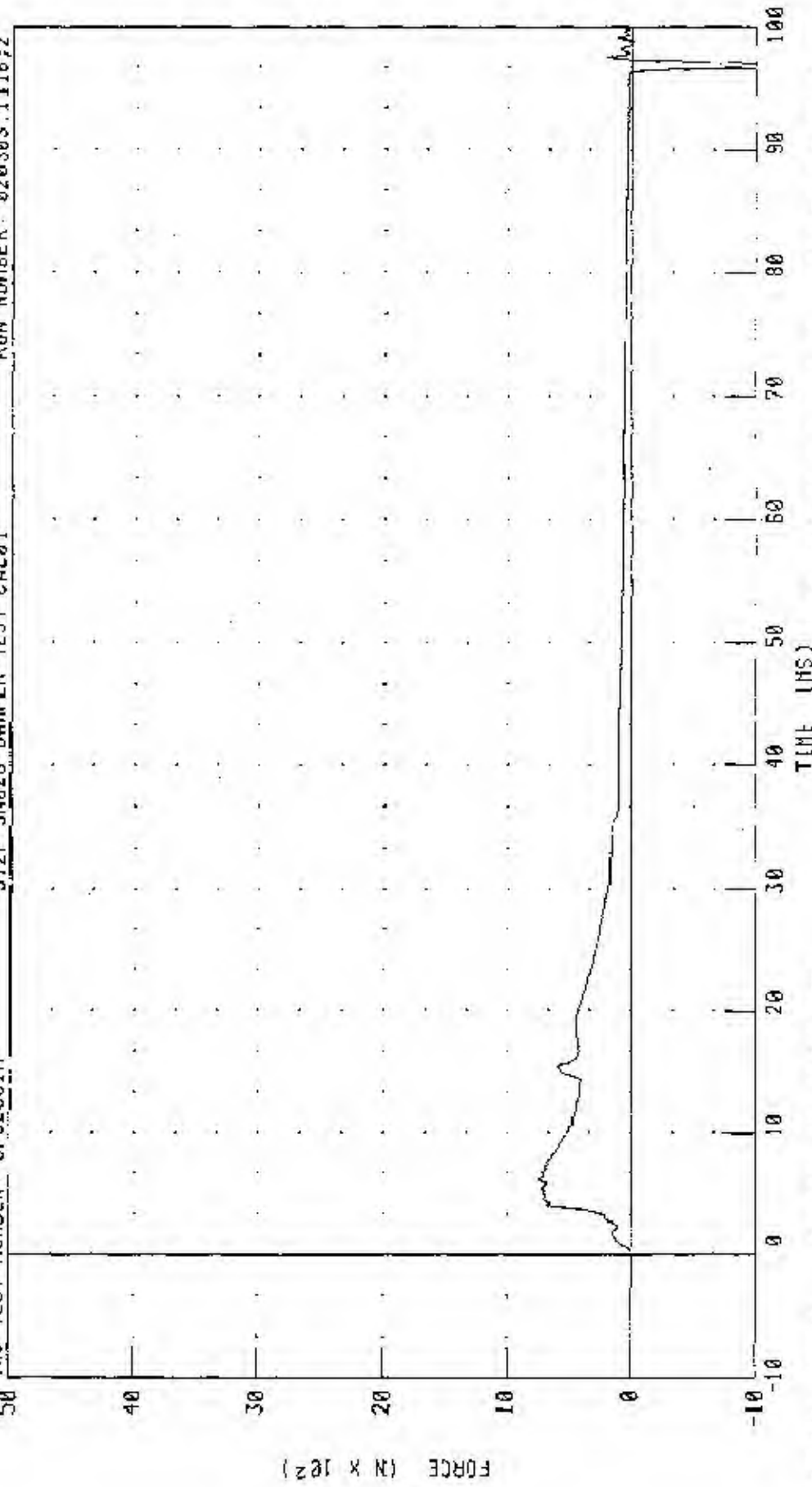
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 N/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN028 DAMPER TEST CAL01

TRC TEST NUMBER: DP02801A

RUN NUMBER: 020303.111672



TIME (MS)

PEAK DATA: 749.74 N @ 16 MS; -1712.81 N @ 96.80 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

FORCE (N x 10²)

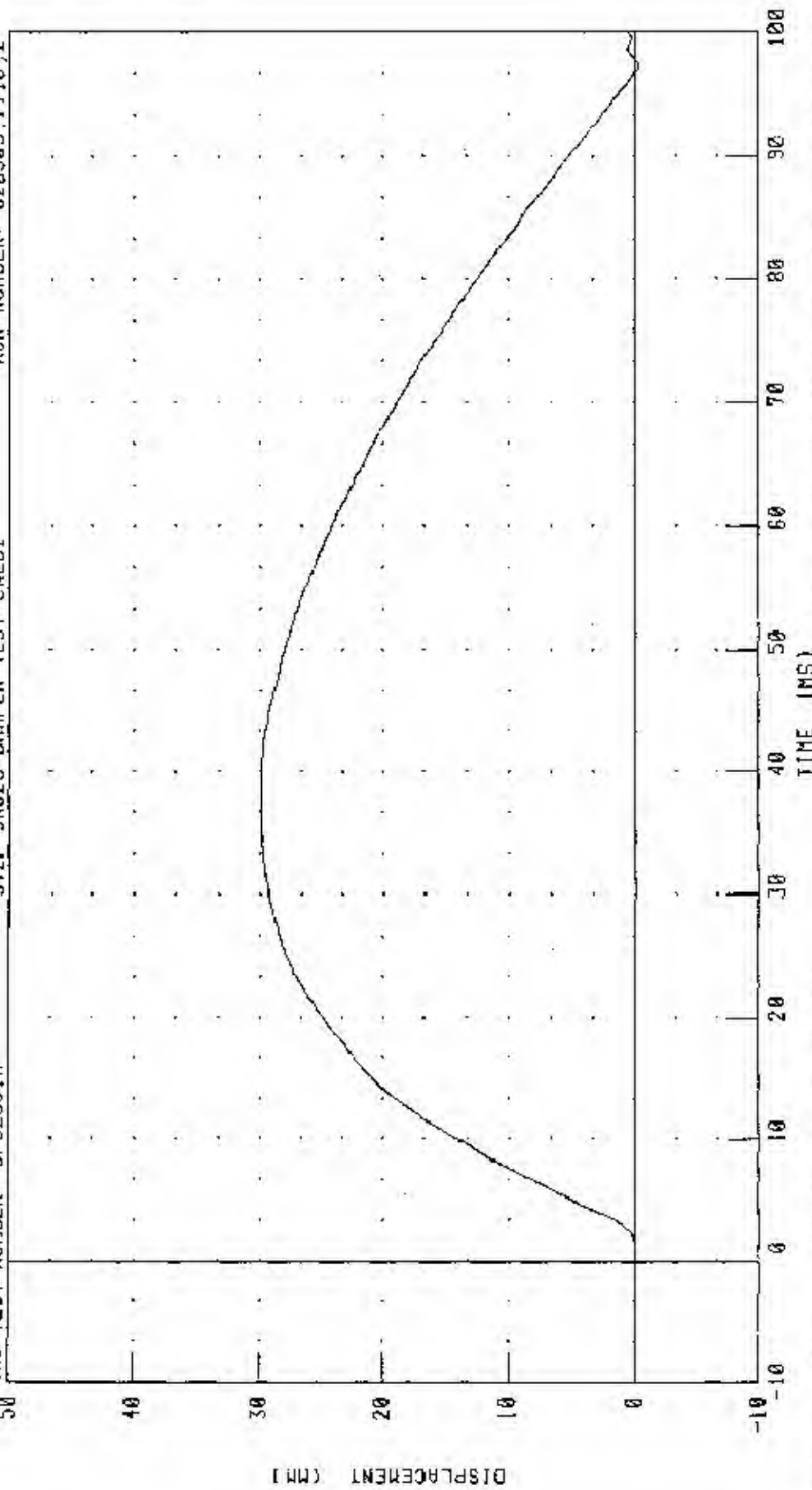
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

RUN NUMBER: 020303.1116.2

IRC TEST NUMBER: DP02B01A

572F SN028 DAMPER TEST CAL01



CHANNEL: CSIYD

FILTER: CH. CLASS 1000

TIME (MS)

PEAK DATA: 29.87 MM @ 35.20 MS, -0.31 MM @ 97.20 MS

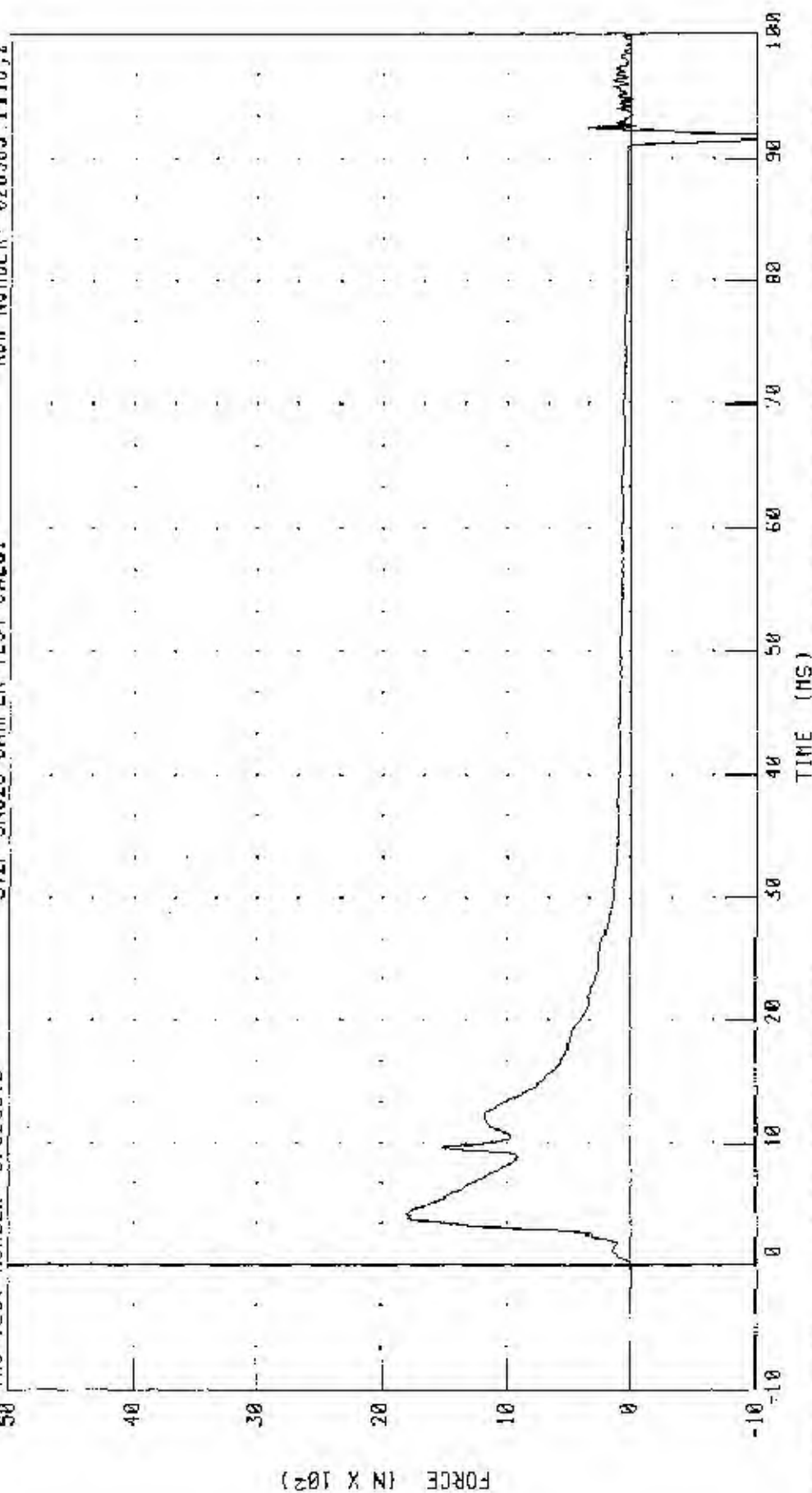
PART 572-F S.I.U. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP02801B

572F SN028 DAMPER TEST CAL01

RUN NUMBER: 020303.1116;2



CHANNEL: DAMPT FILTER: CH. CLASS 1000

PEAK DATA: 1791.40 N @ 4.16 MS; -2104.23 N @ 91.68 MS

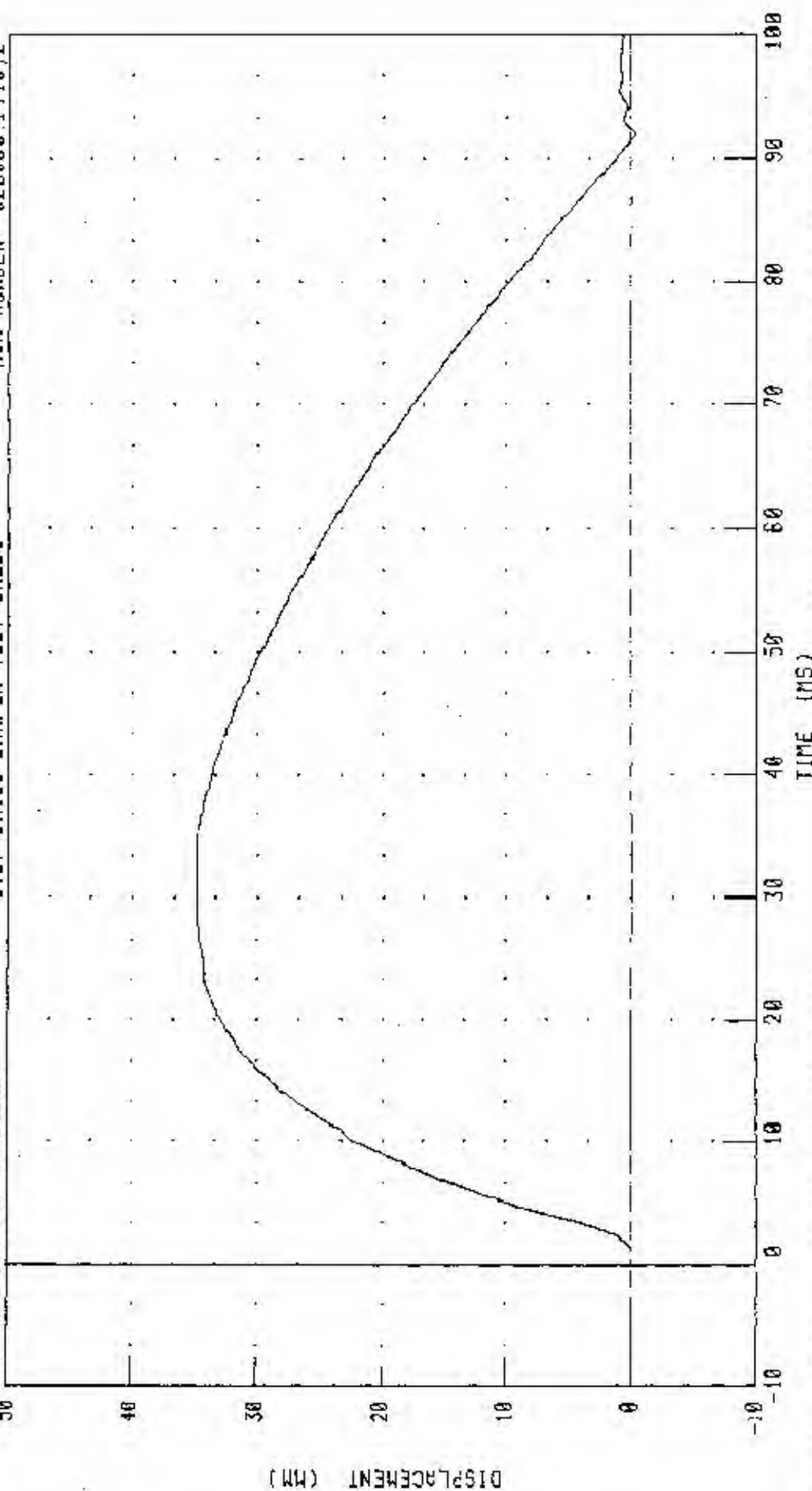
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP02801B

572F SN028 DAMPER TEST CAL01

RUN NUMBER: 02B303.1116;2



CHANNEL: CSTYO FILTER: CH. CLASS 1000

PEAK DATA: 34 90 MM @ 30 64 MS; -0.40 MM @ 92.00 MS

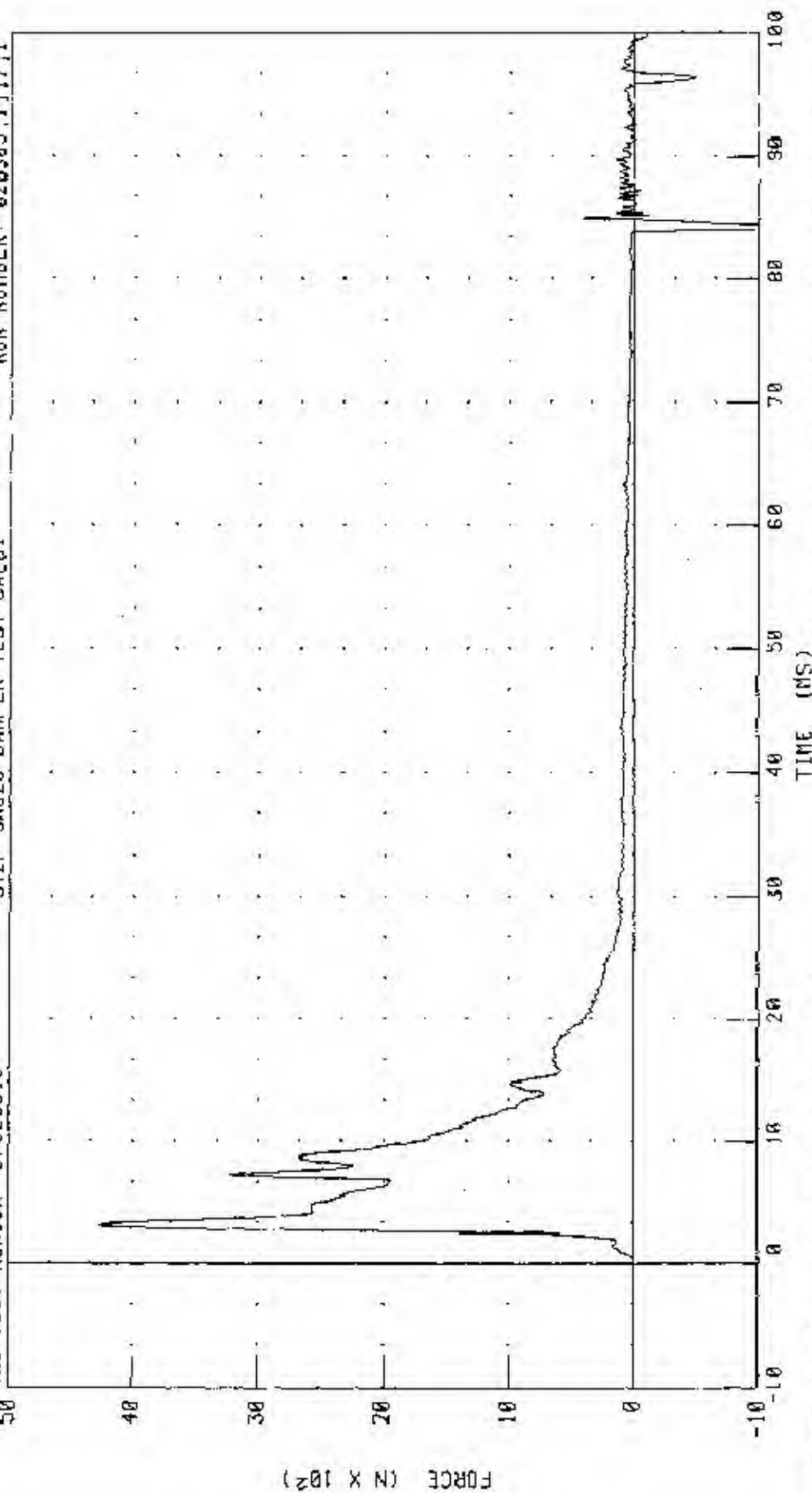
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP02B01C

572F SN020 DAMPER TEST CAL01

RUN NUMBER: 020303, 1117, 1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 4259.31 N @ 3.12 MS; -2213.12 N @ 84.24 MS

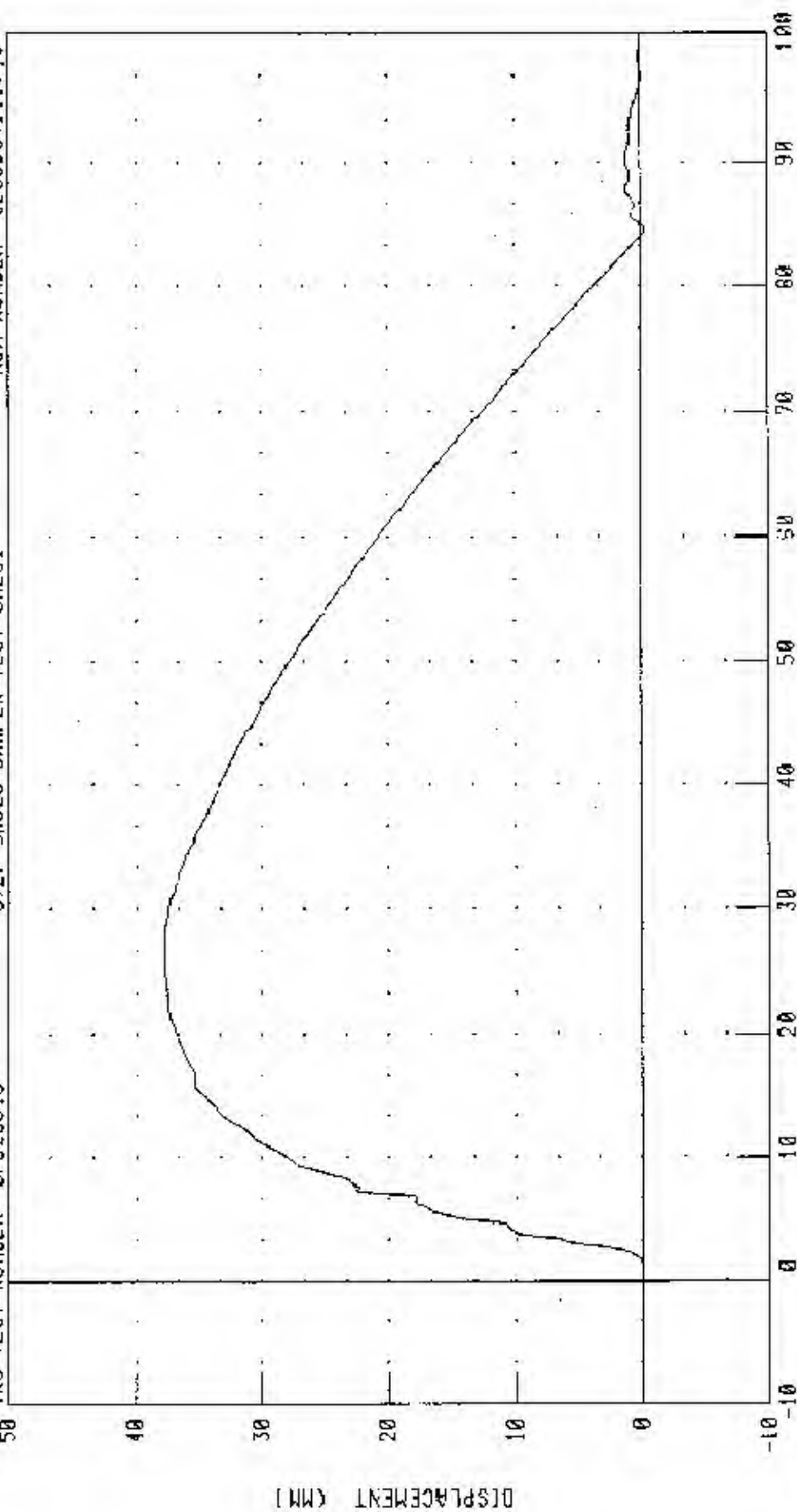
PART 572-F S I U. THURACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC.)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP02001C

572F SN028 DAMPER TEST CAL01

RUN NUMBER: 020303.1117.1



TIME (MS)

CHANNEL: CSTVD FILTER: CH CLASS 1000

PEAK DATA: 37.75 MM @ 26.56 MS, -0.36 MM @ 84.48 MS

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 16-Apr-03

TRC, INC. TEST NO: 028C05LF1 572B SN 028 TORSO FLEX CAL 05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	21.9 °C
RELATIVE HUMIDITY	10 – 70 %	39 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	115.7 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	177.9 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	213.5 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6.0 °

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572B Abdomen Compression Test

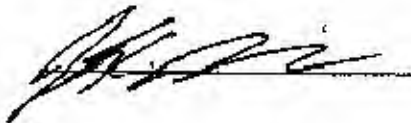
HIII SID Serial No. 028 Calibration No. 05 - 1

Test Date 04/16/2003

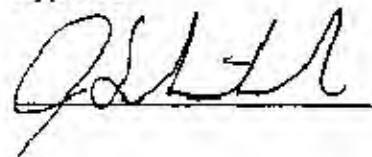
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.2 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.0 - 8.1 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.18.2003 09:12:04 98

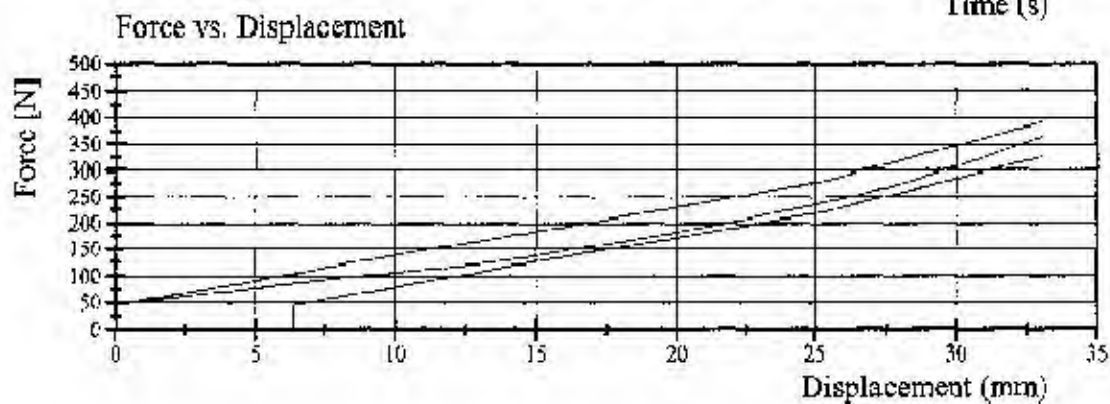
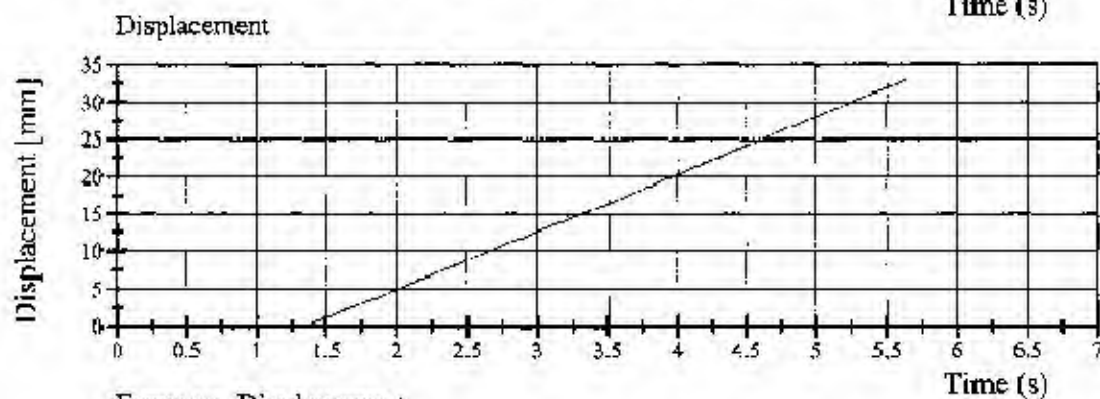
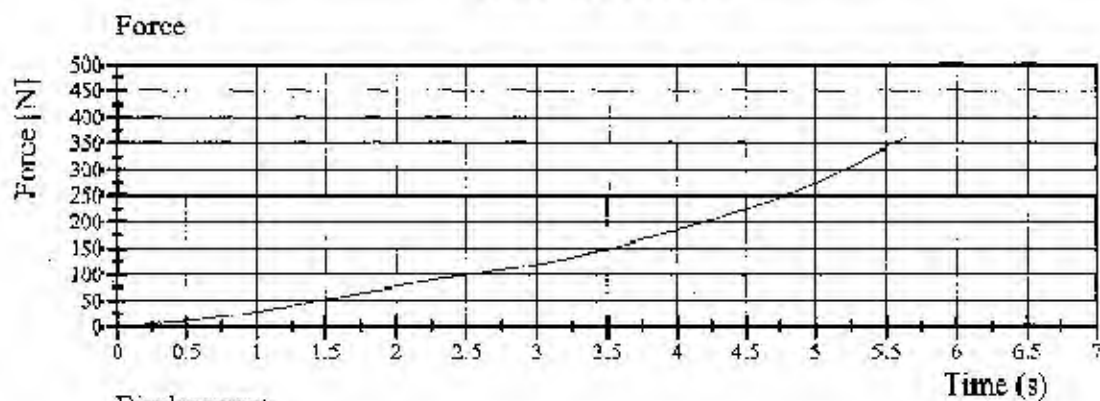


Transportation Research Center Inc.

572B Abdomen Compression Test

HIH SID Serial No. 028 Calibration No. 05 - 1

Test Date 04/16/2003



04.18.2003 09:12:05 98



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

16-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

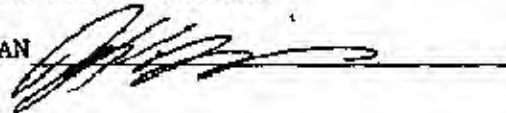
TEST NO: SPL02805

572F SNO28 LEFT PELVIS CAL05

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	41.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.30 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	48.4 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.2 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041603.1024;1

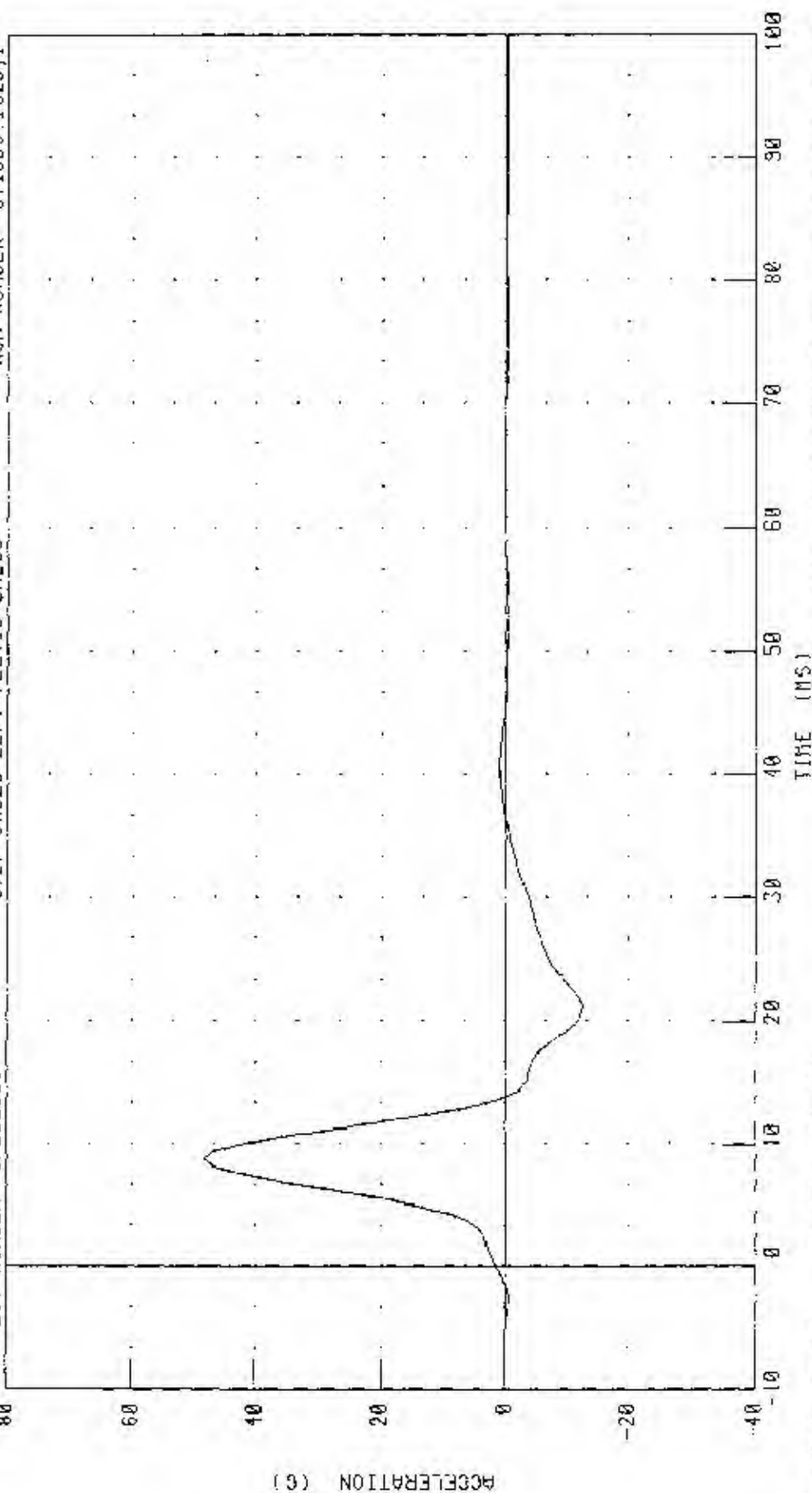
PART 572-F S.I.G. PELVIS CALIBRATION (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL02805

572F SN028 LEFT PELVIS CAL05

RUN NUMBER: 041603.1025;1



CHANNEL: PELVIS FILTER: FIR 100

PEAK DATA: 49.40 G @ 0.75 MS; 12.52 G @ 71.75 MS

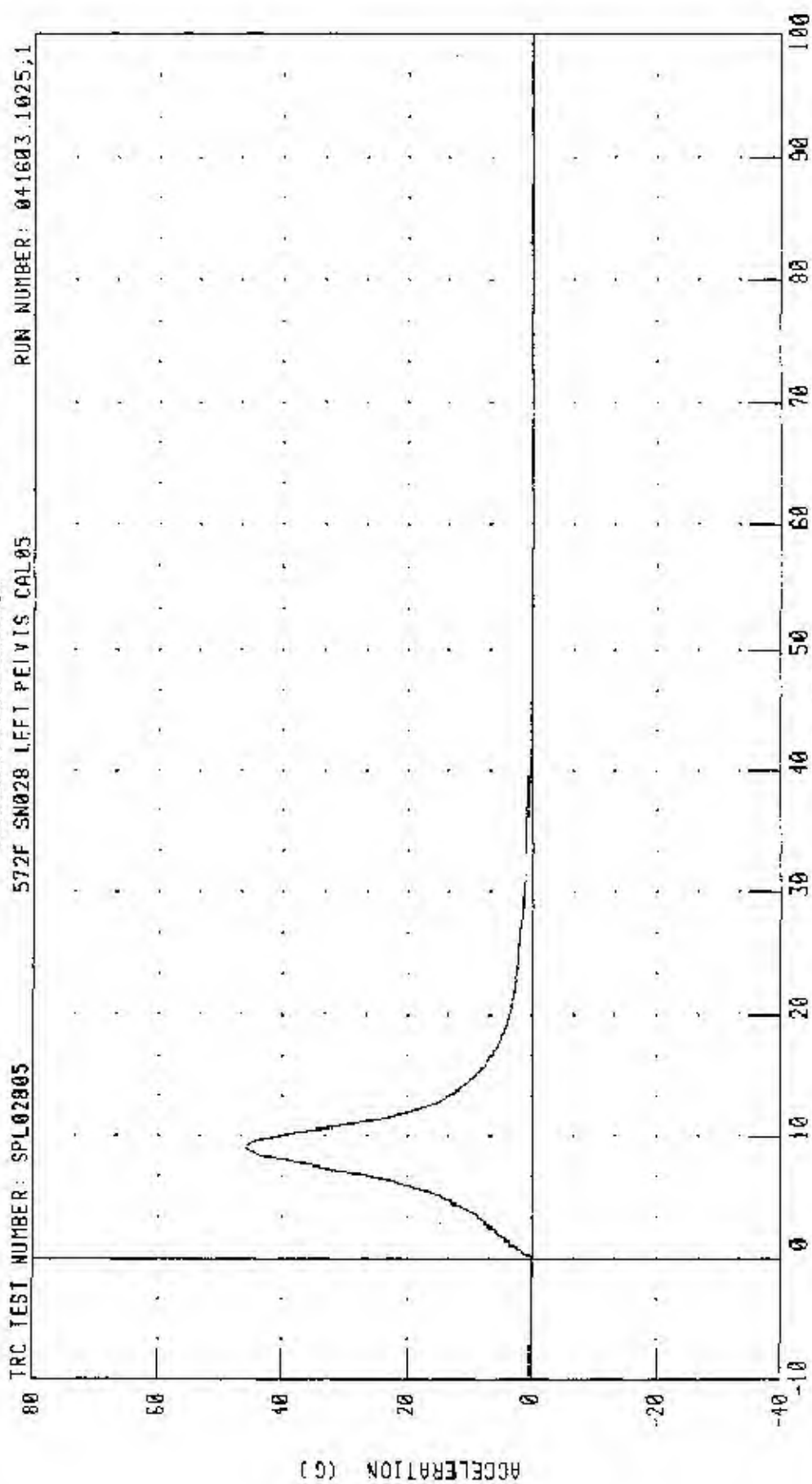
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL02805

572F SN028 LEFT PELVIS CAL05

RUN NUMBER: 041603.1025.1



TIME (MS)

CHANNEL PENXG FILTER: CH CLASS 1000

PEAK DATA 45.71 G @ 9.34 MS; -0.33 G @ 51.44 MS

Calibration Test Results

Pre-Test

SID: 065

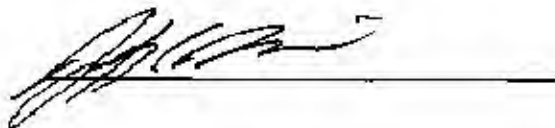
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements (tested on April 17, 2003 for a previous calibration series).
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.
572M SID/HIII Dummy
External Dimensions
Serial No. 065 Calibration No. 09

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	896 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	510 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	239 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	513 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	500 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	371 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	170 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	171 mm	Yes
Difference Between Top & Bottom Rib Width from CL		\leq 2.5 mm	1.0 mm	Yes

Technician



Approved



TTC

TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

SID/HIII DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL06509

572N SID/HIII SN065 HEAD CAL09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.11 deg. C
RELATIVE HUMIDITY	10 - 70 %	25.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	137.25 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-10.26 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042503.1431;1

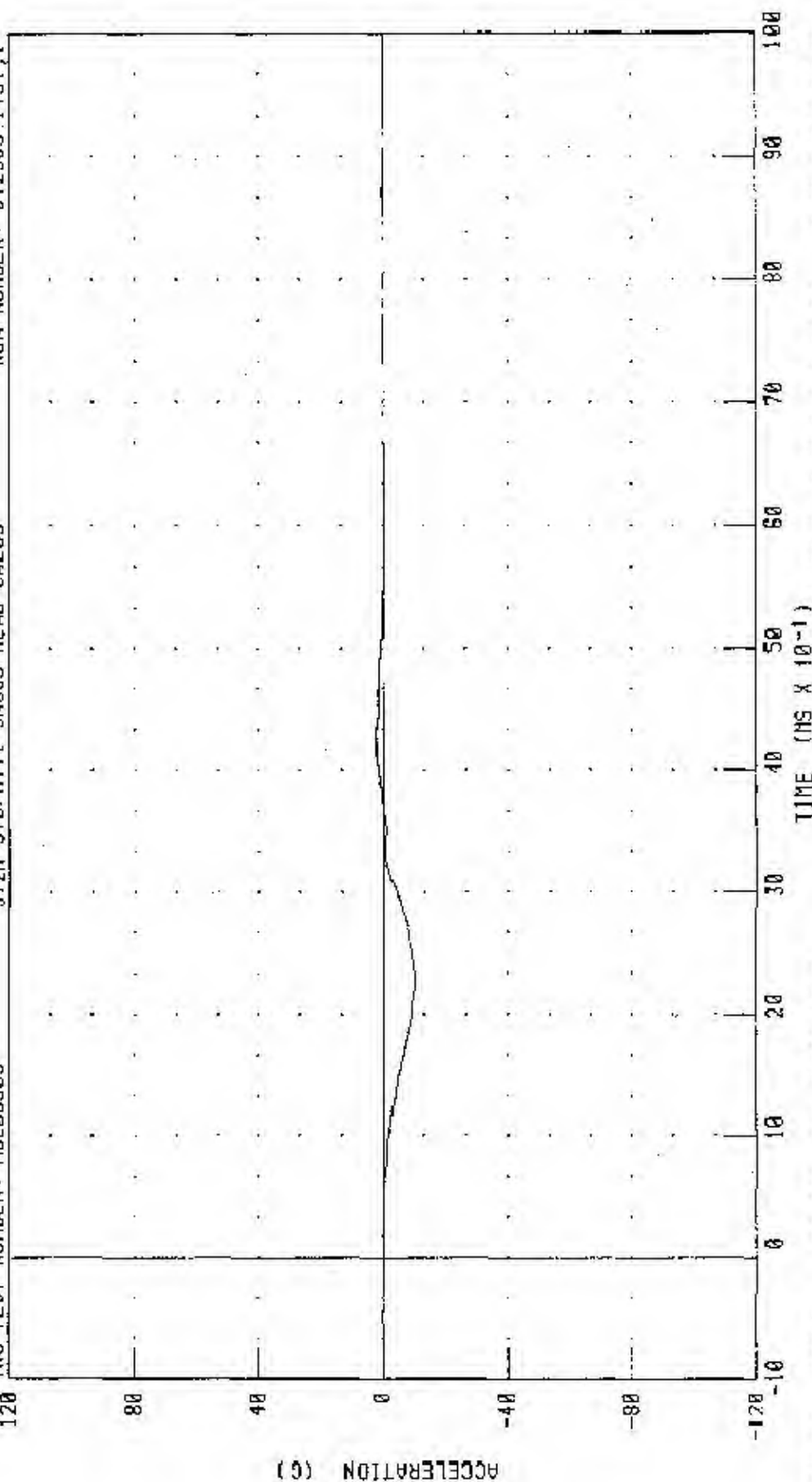
572M SID/HI II DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL06509

572M SID/HI II SN065 HEAD CAL09

RUN NUMBER: 042503.1431.1



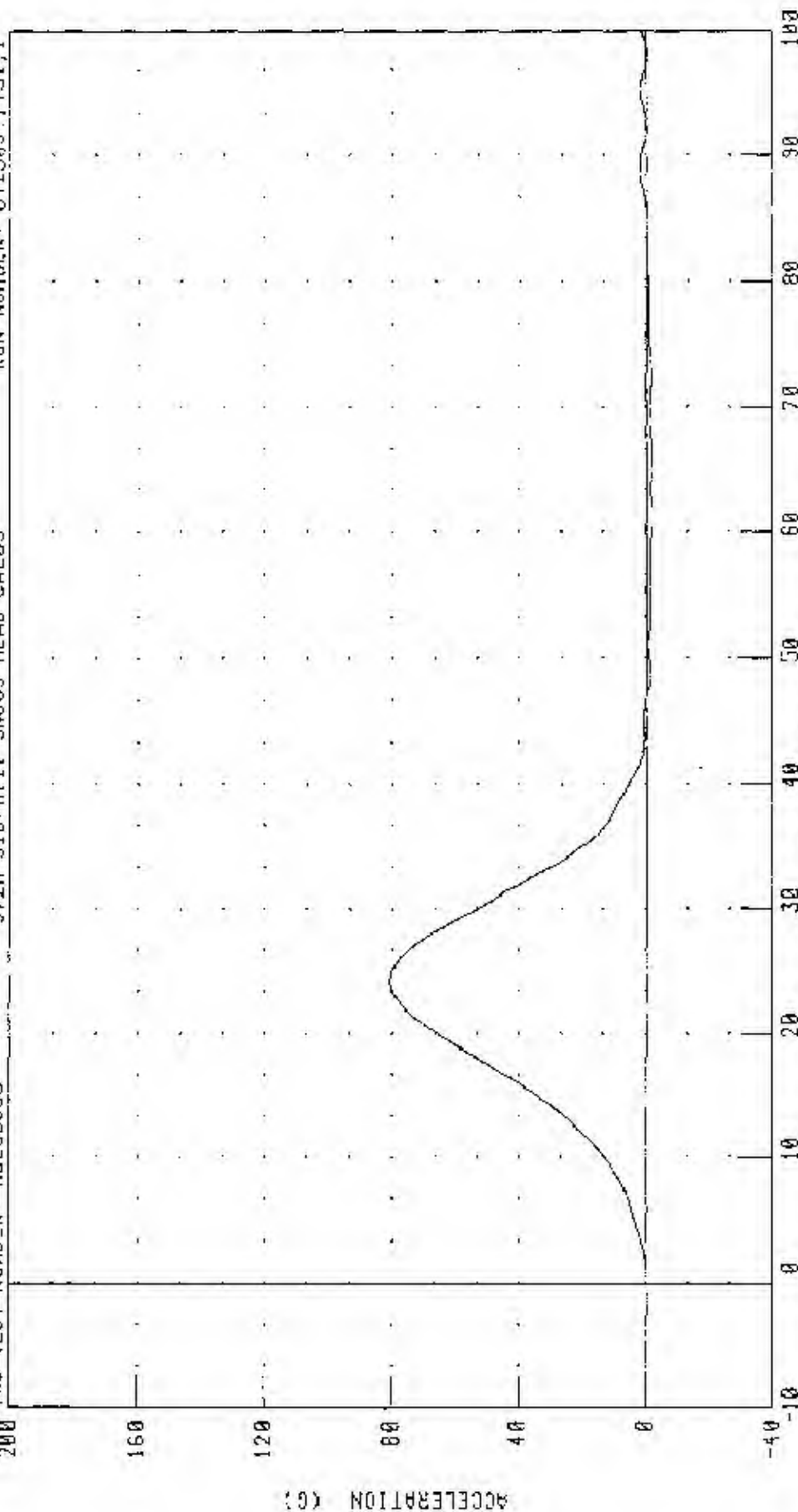
CHANNEL: HEDXG FILTER: CH CLASS 1000

PEAK DATA: 2.37 G @ 4.24 MS; -10.26 G @ 2.24 MS

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HDL06509 572M SID/HIII SN065 HEAD CAL09 RUN NUMBER: 042503.1431.1



TIME (MS X 10⁻¹)

PEAK DATA: 90.91 G @ 2.40 MS; -2.11 G @ 6.00 MS

CHANNEL: HEADYG FILTER: CHL CLASS 1800

ACCELERATION (G)

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

RUN NUMBER: 042503.1431,1

572M SID/HIII SN065 HEAD CAL09

TRC TEST NUMBER: HDL06509

200

150

120

80

40

0

-40

ACCELERATION (G)

TIME (MS X 10⁻¹)

100

90

80

70

60

50

40

30

20

10

0

-10

CHANNEL: HD02G FILTER: CH CLASS 1000

PEAK DATA: 110.65 G @ 2.48 MS; -0.13 G @ -0.64 MS

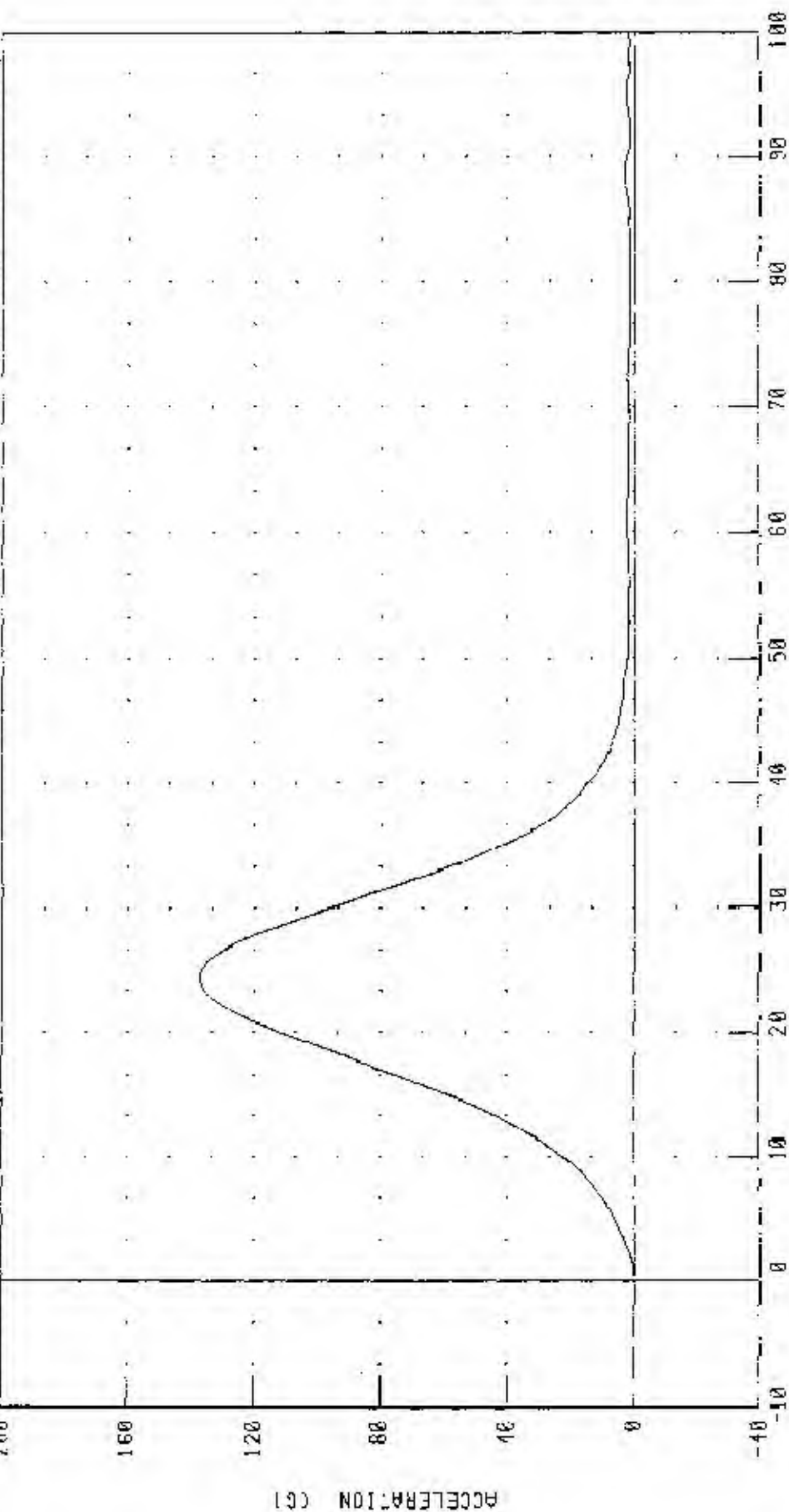
572M SID/HILL DUNNY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

IRC TEST NUMBER: HD108509

572M SID/HILL SN065 HEAD CAL09

RUN NUMBER: 042503 1431.1



TIME (MS X 10⁻¹)

CHANNEL: HFDRG FILTER: CH CLASS 1000

PEAK DATA: 137.25 G @ 2.40 MS; 0.03 G @ 0.08 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

SID/HIII DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. NFL06509

572M SID/HIII SN065 NECK CAL09

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.11 deg. C
RELATIVE HUMIDITY		10 - 70 %	25.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.46 M/S
	20 MS	4.12 - 5.10 M/S	4.84 M/S
	30 MS	5.73 - 7.01 M/S	6.76 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.08 - 7.18 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	69.99 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	60.40 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	81.72 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	51.44 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.00 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042503.1308;1

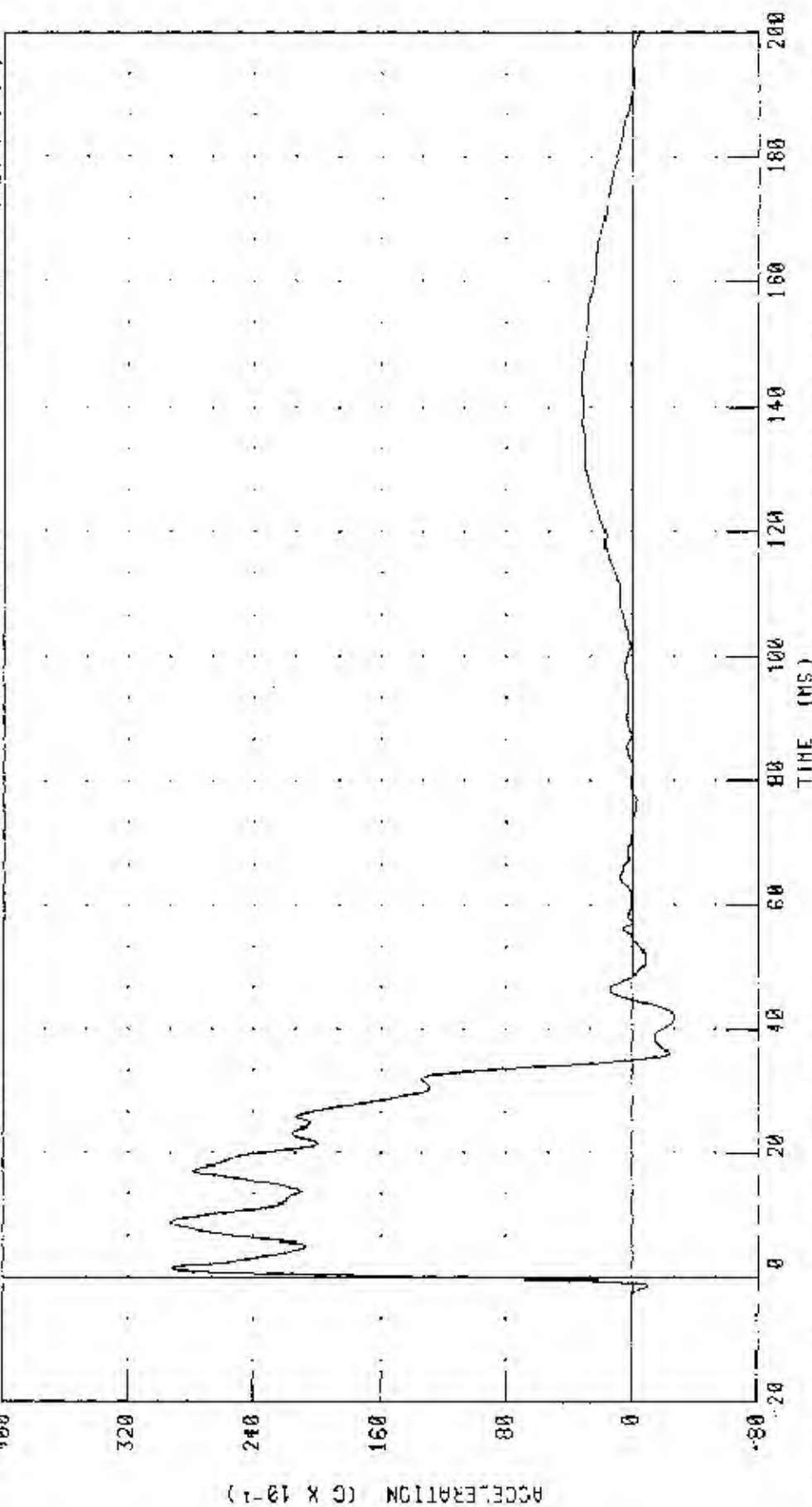
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

TRC TEST NUMBER: NFL06509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1509.1



PEAK DATA: 28 28 0 3 36 MS; -2 73 0 0 42 08 MS

FILTER: CH. CLASS 180

CHANNEL PENXC

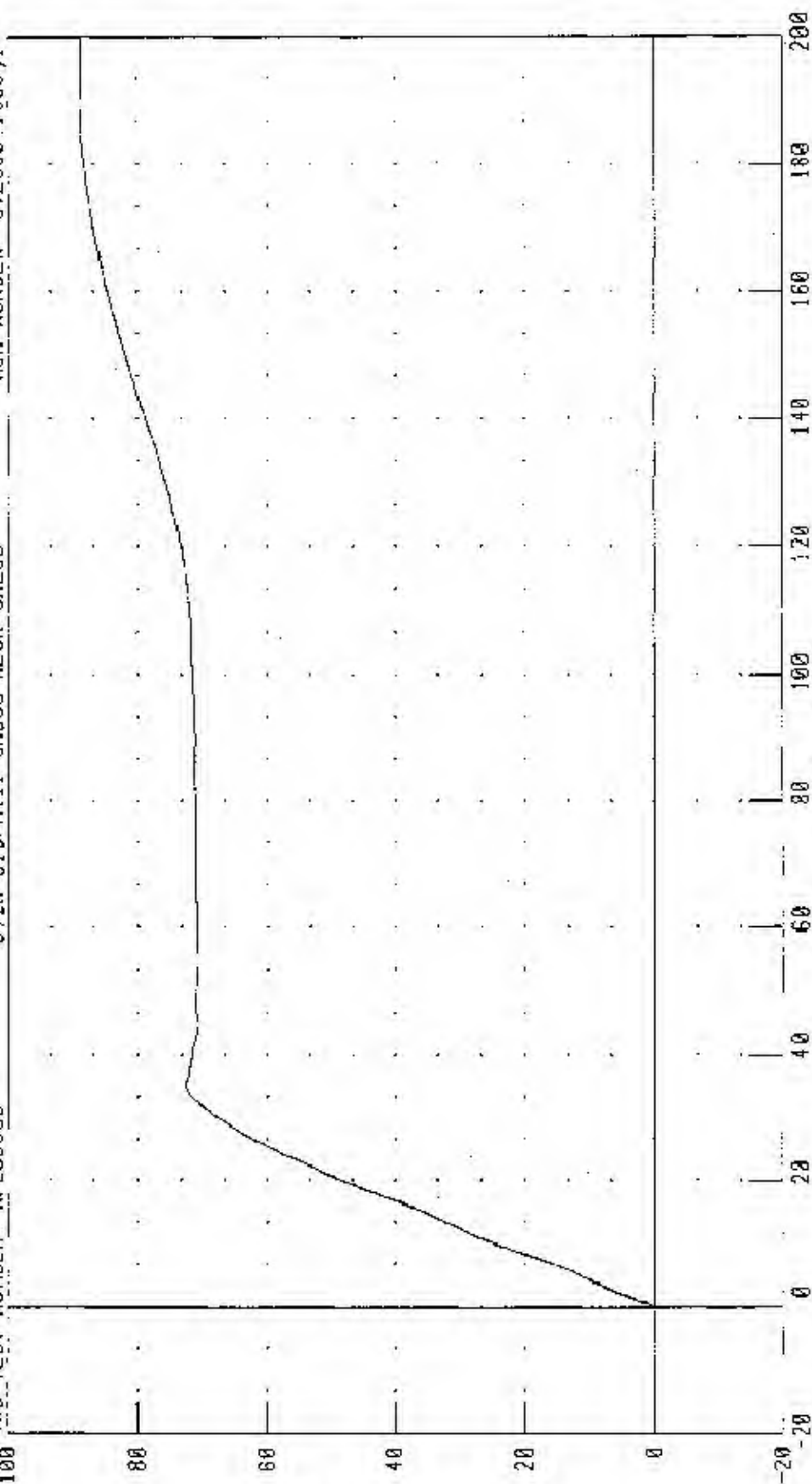
572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

IPC TEST NUMBER: N100509

572M SID/HIII SN065 NECK CAL09

RUN NUMBER 042503.1309.1



VELOCITY (M/S X 10-1)

TIME (MS)

CHANNEL: PENXVI FILTER: CH. CLASS 180

PEAK DATA: 0.07 M/S @ 190.48 MS, -0.01 M/S @ -0.72 MS

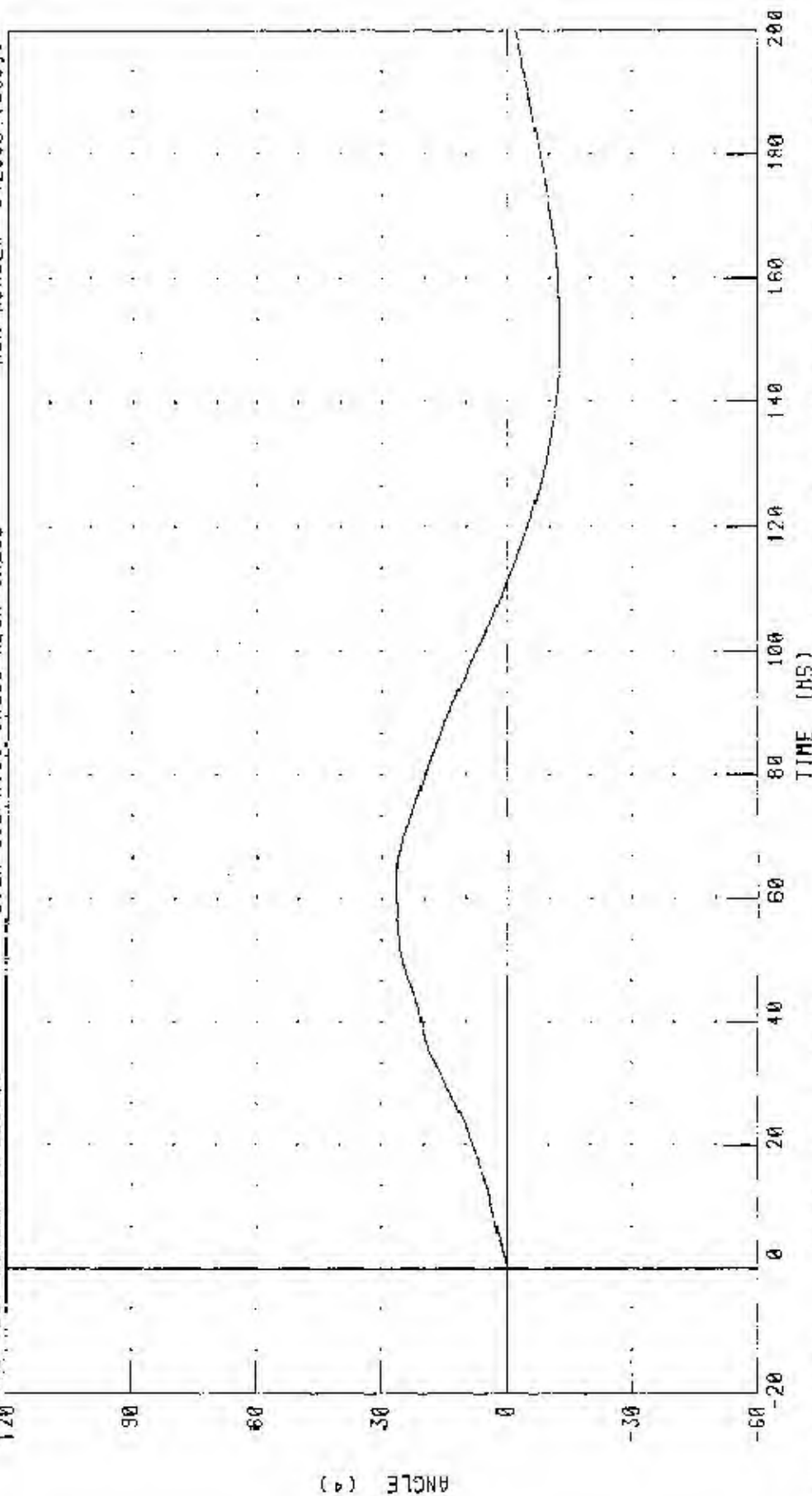
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK IFST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06509

572M SID/HILL SN065 NECK CAL09

RUN NUMBER 042503.1309.1



ANGLE (°)

TIME (NS)

PEAK DATA: 26.93 ° @ 62.56 NS; -12.54 ° @ 150.72 NS

CHANNEL: BETA FILTER: CH. CLOSE 60

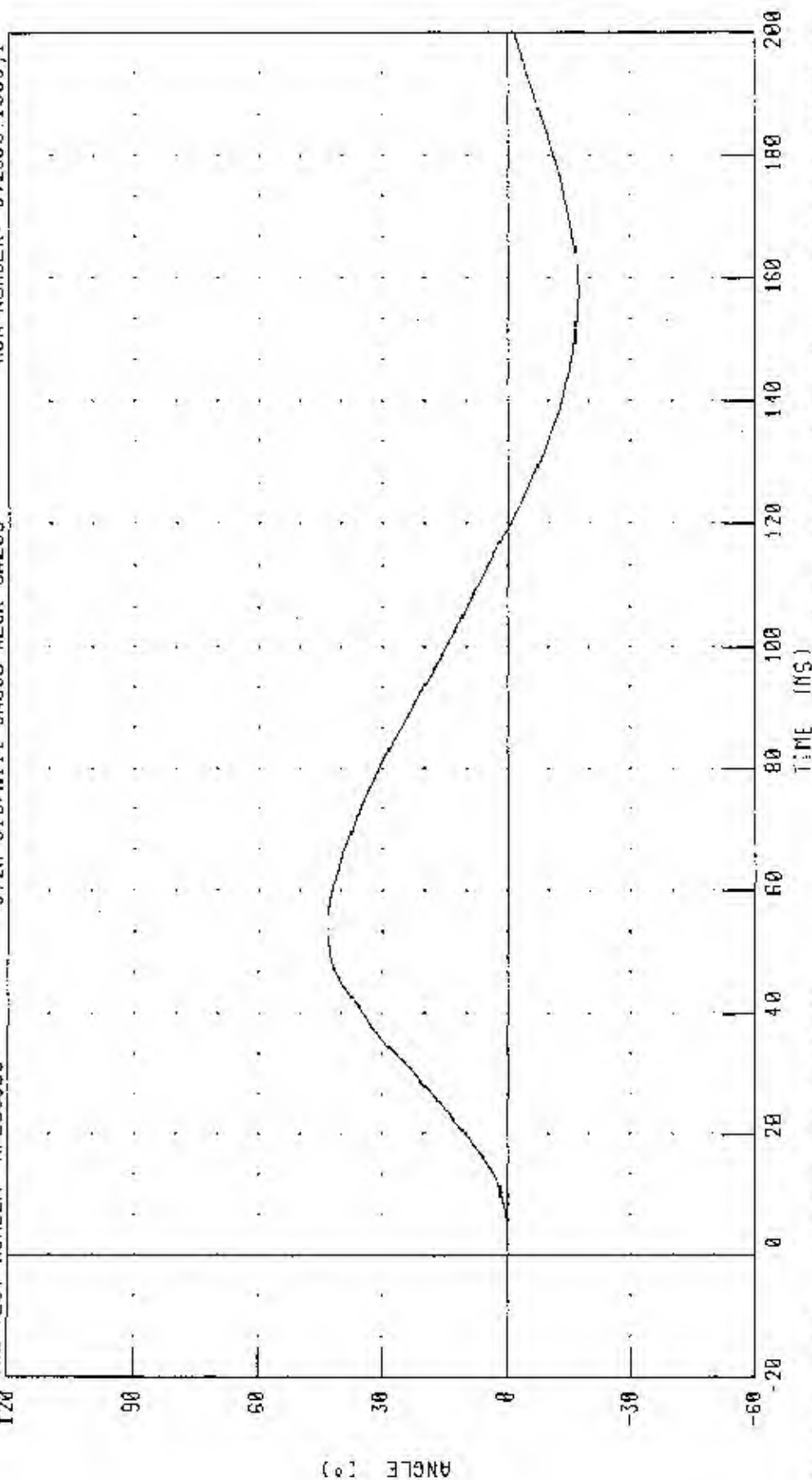
572M SID/HJII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06549

572M SID/HJII 5N065 NECK CAL09

RUN NUMBER: 042503.1309.1



CHANNEL: THEIA FILTER: CH. CLASS 60

PEAK DATA: 43.65 ± 0.54.72 NS, -17.24 ± 0.157.76 NS

ANGLE (°)

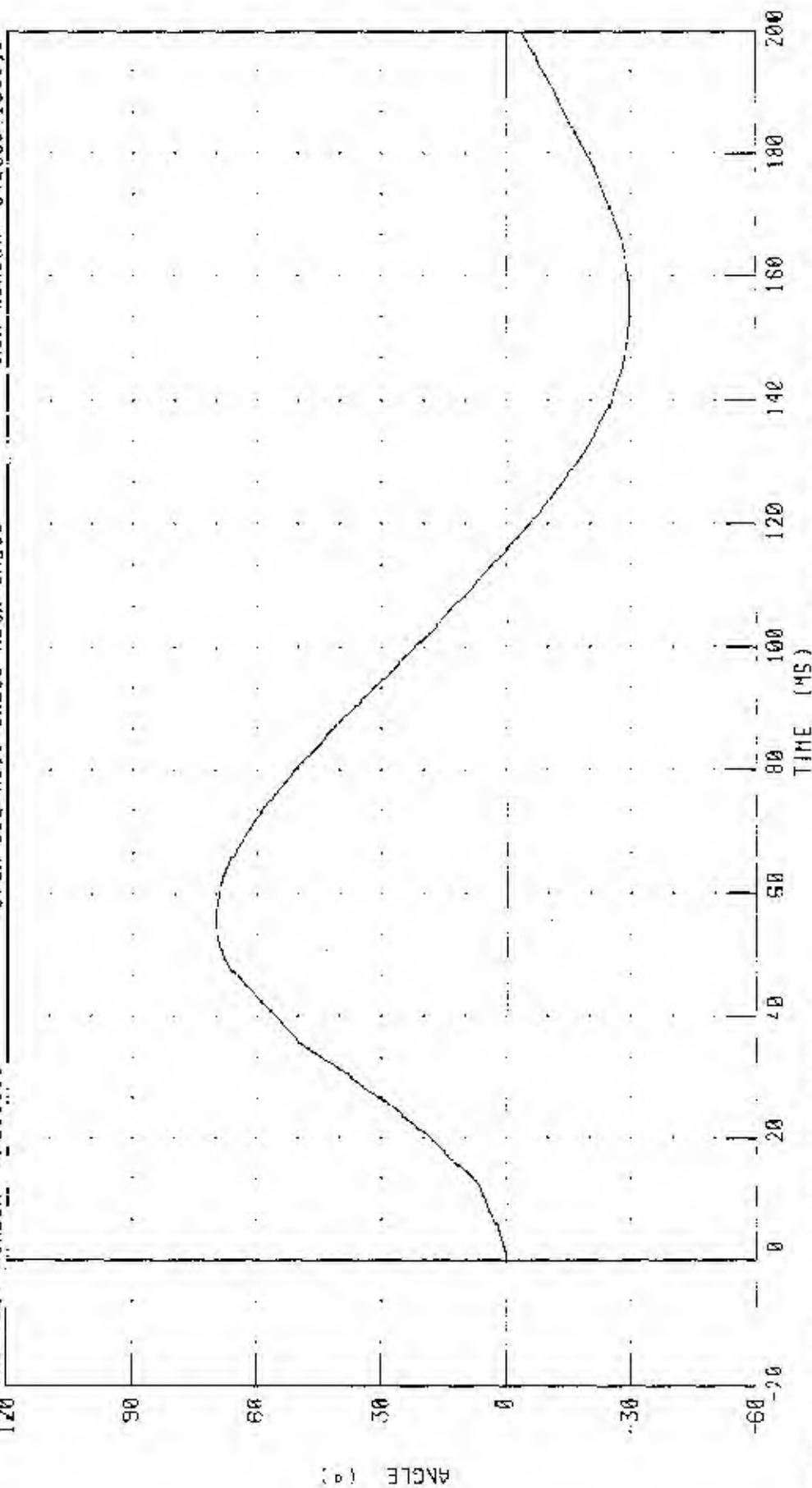
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

IRC TEST NUMBER: NFL06509

572M SID/HILL SWBSS NECK CAL09

RUN NUMBER: 042503.1303.1



CHANNEL: TOTAL

FILTER: CH. CLASS 60

PEAK DATA: 60.30 ° @ 55.60 MS; -73.64 ° @ 156.40 MS

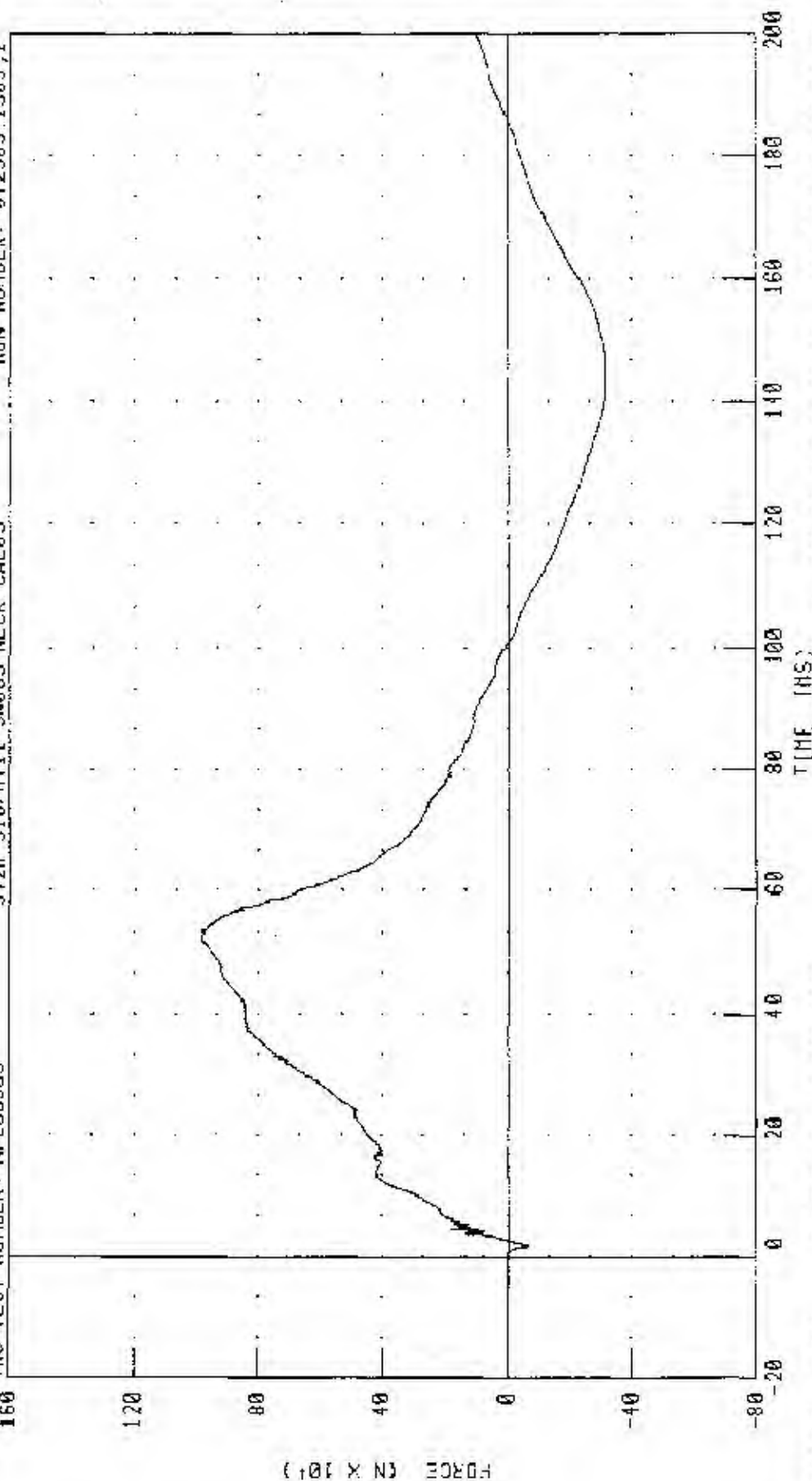
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER: NFO06509

572M SID/HILL SM065 NECK CAL09

RUN NUMBER: 042503.1309.1



CHANNEL: NERYF FILTER: CH CLASS 1000

PEAK DATA: 978.96 N @ 52.08 MS, -318.12 N @ 143.84 MS

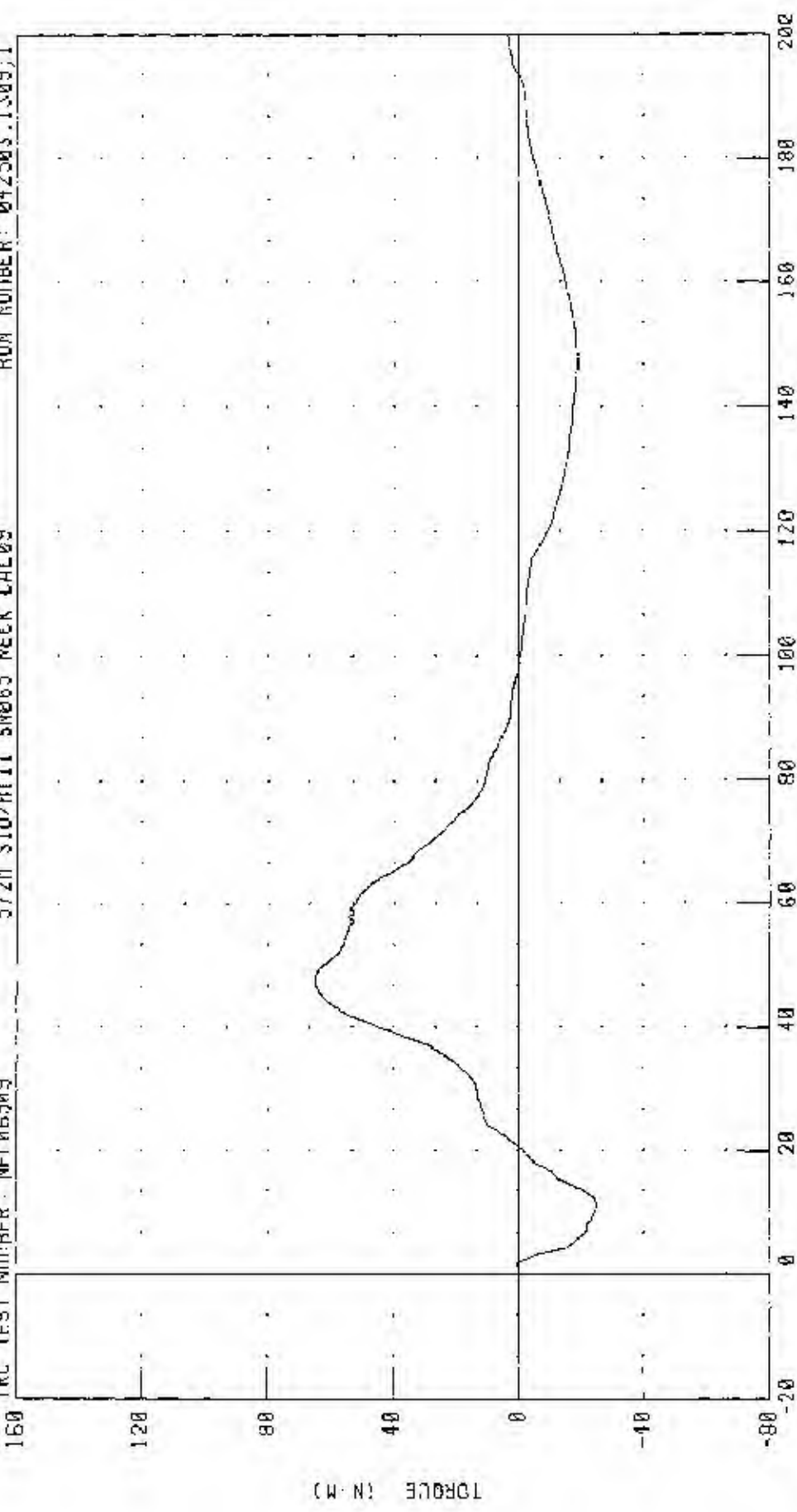
572M SIU/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NF106509

572M SIU/HIII SN065 NECK CAL09

RUN NUMBER: 042503.1309.1



TIME (MS)

PEAK DATA 55.37 N M @ 47.44 MS, 24.87 N M @ 11.28 MS

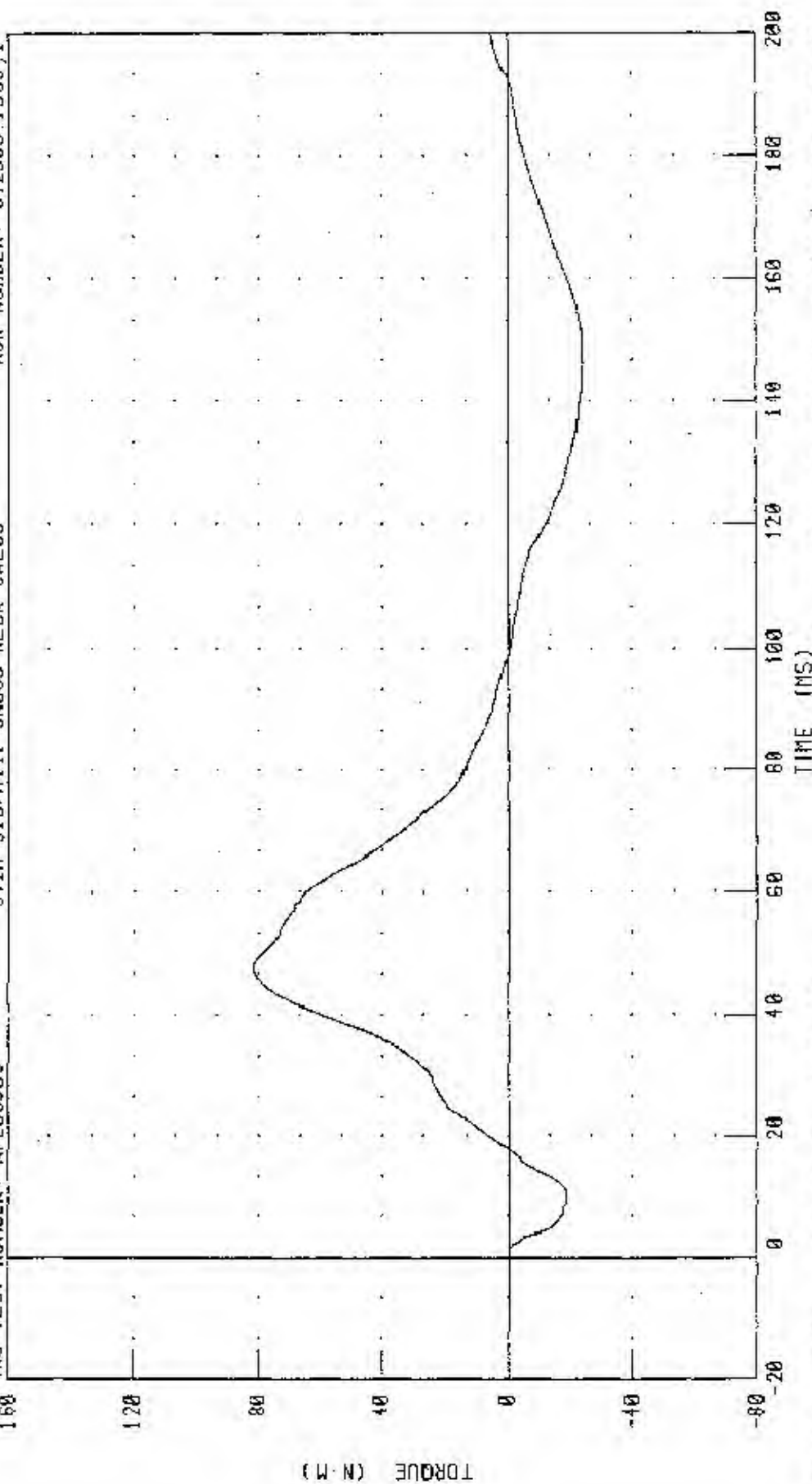
CHANNEL: NECKXM FILTER: CII CLASS: 600

572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFI06509

572M SID/HILL SN065 NECK CAL09

RUN NUMBER: 042503.1309.1



CHANNEL: NEKOM FILTER: CIL CLASS 600

PEAK DATA: 8) 72 N M @ 47 60 MS, -24 32 N M @ 146 56 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

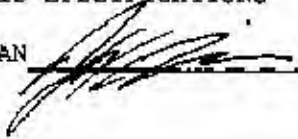
TRC INC.

TEST NO: STLO6509

572F SID SN065 L.THORAX CAL09

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	26.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.25 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	40.2 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	39.1 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	20.1 G

TEST MEETS SPECIFICATIONS

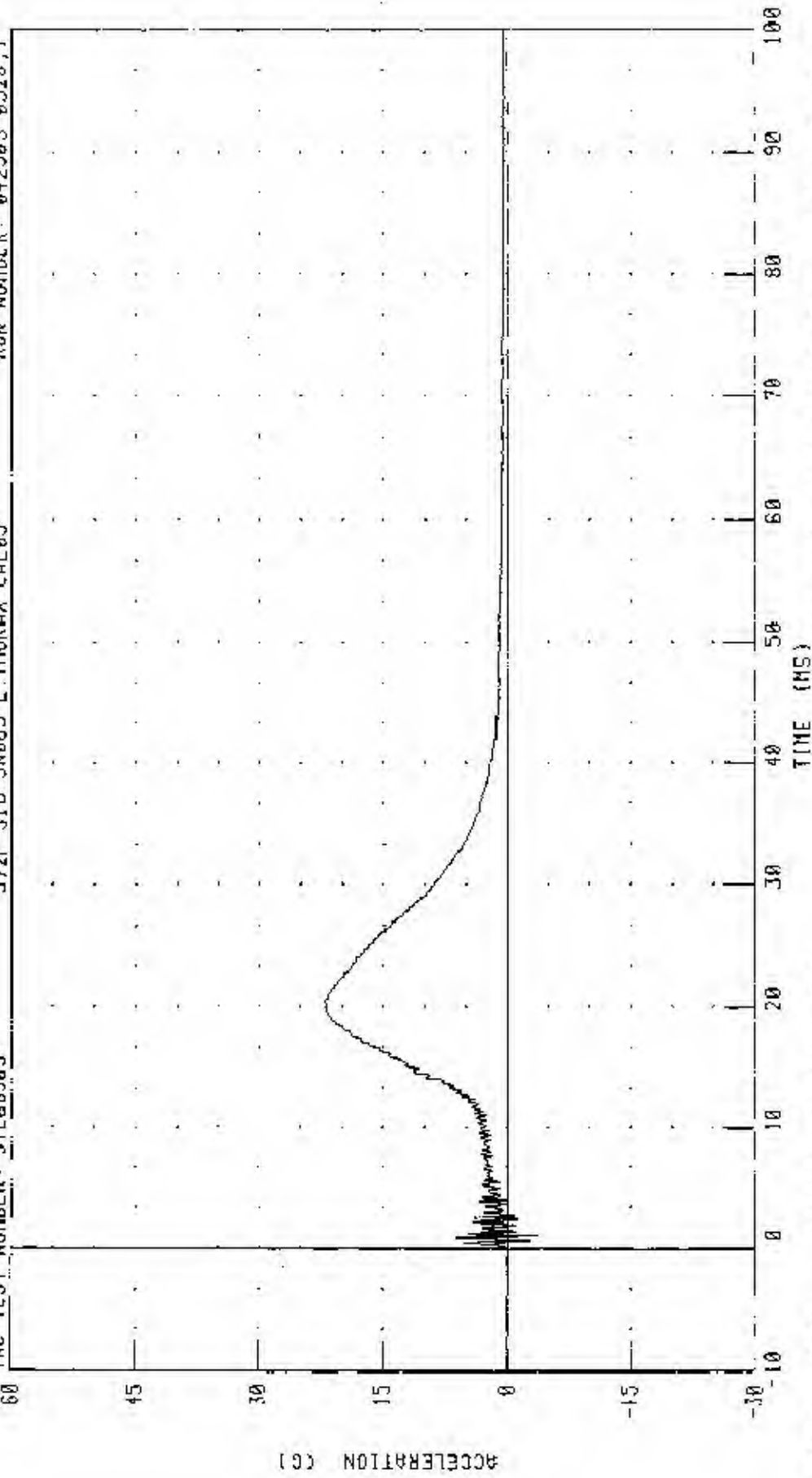
TECHNICIAN 

RUN NUMBER: 042503.0928;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: 5106509 572F SID S865 L THORAX CAL09 RUN NUMBER: 042503 0928,1

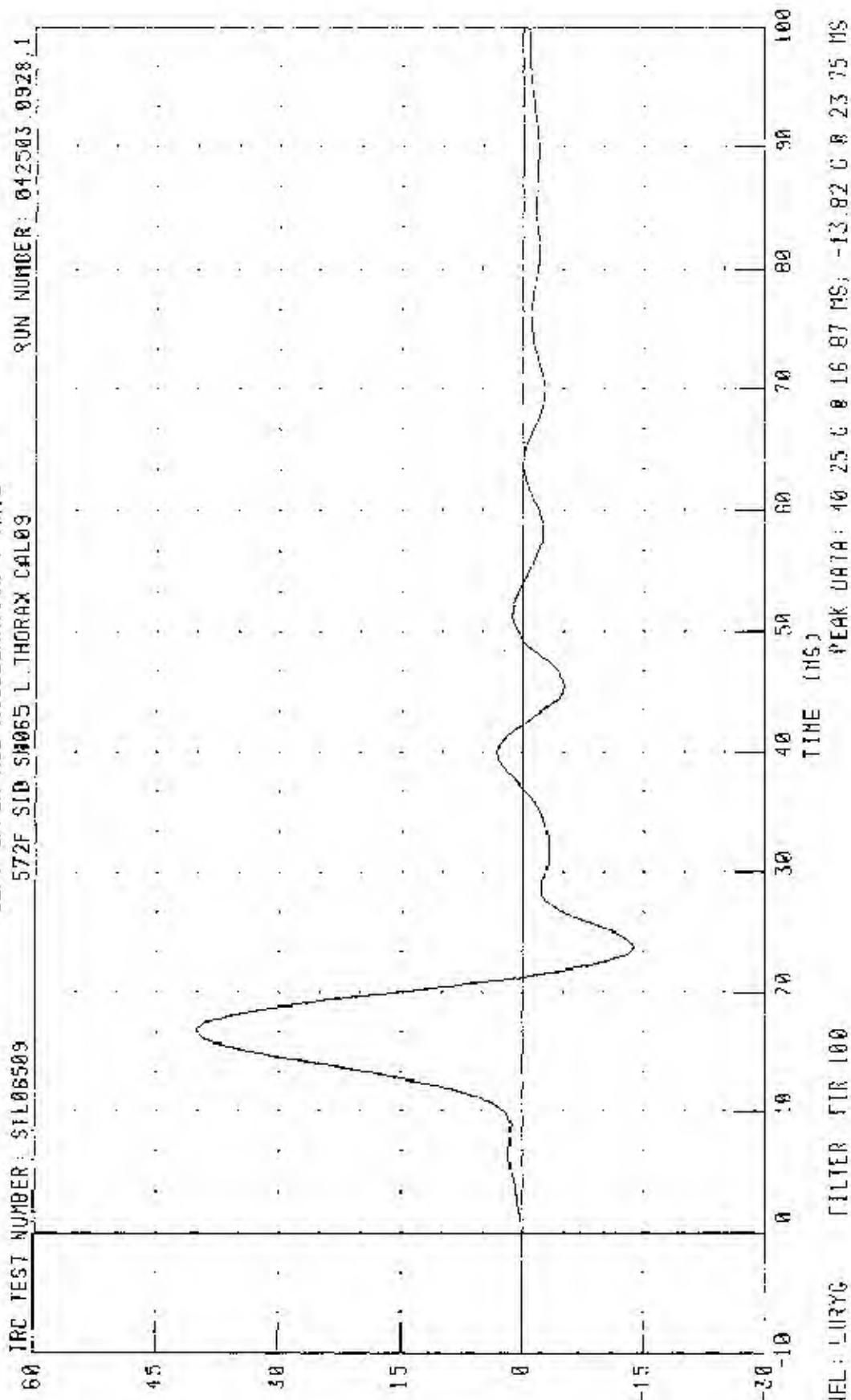


CHANNEL: PENXC FILTER: CH CLASS 1000

PEAK DATA: 22.11 G @ 20.40 MS, -3.65 G @ 1.04 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS



ACCELERATION (G)

C-55

030430

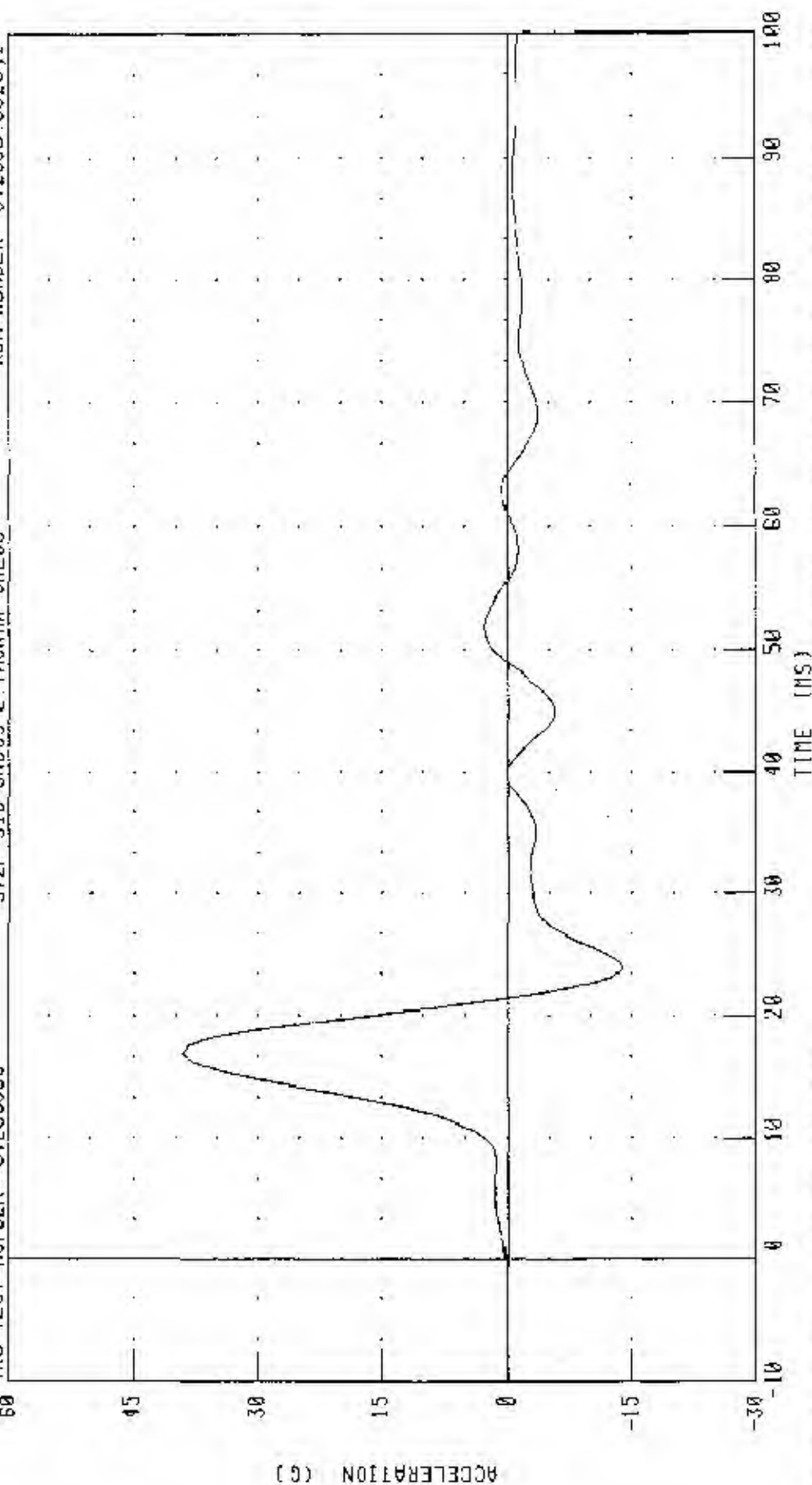
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: ST106509

572F SID SN065 L THORAX CAL09

RUN NUMBER: 042503.0928;1



CHANNEL: L1RYG FILTER: FIR 100

PEAK DATA: 39.09 G @ 16.07 MS, -13.87 G @ 23.75 MS

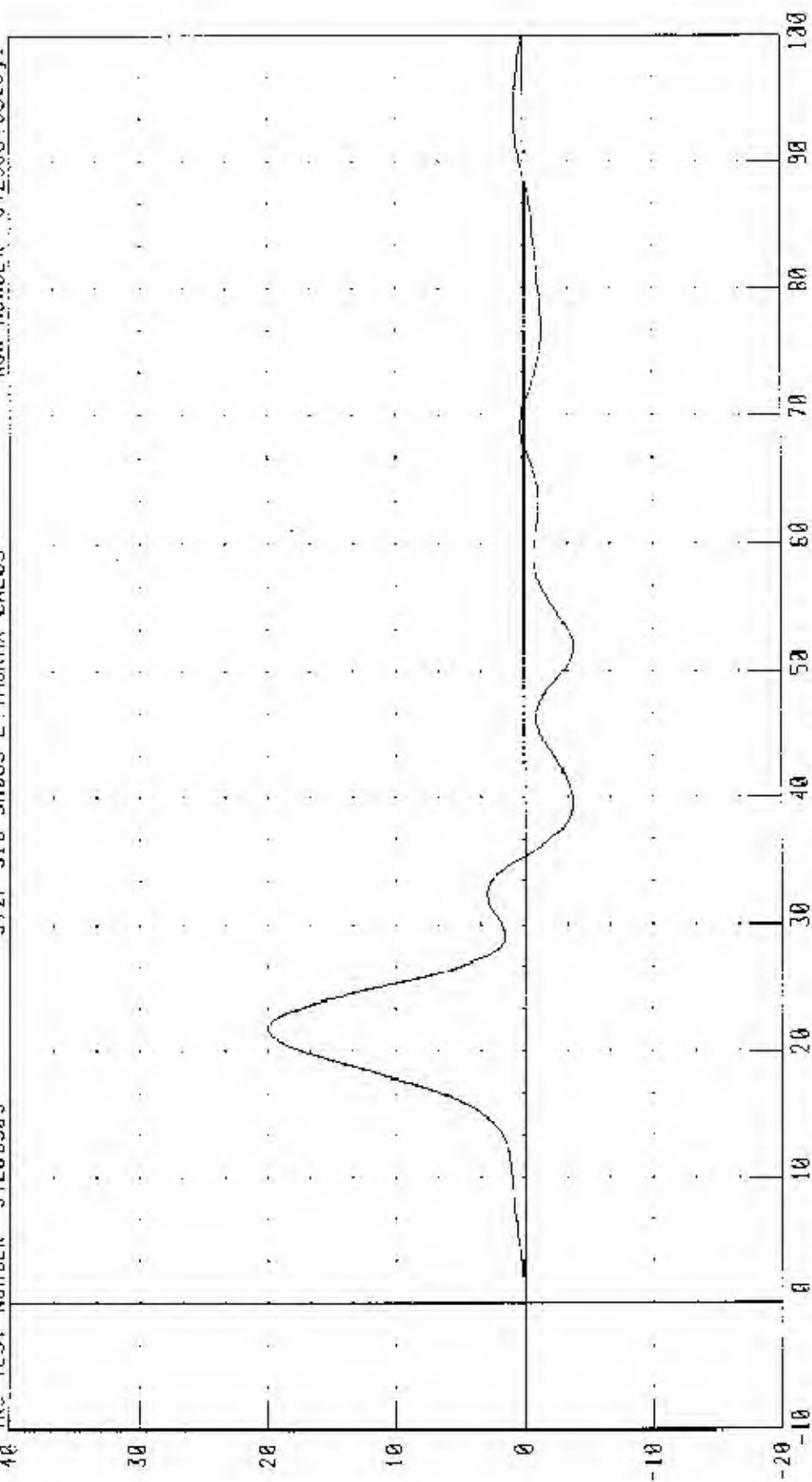
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER - STL06509

572F SID SN065 L THORAX CAL09

RUN NUMBER: 042503-0928,1



TIME (MS)

FILTER: FIR 100

CHANNEL T12YG

PEAK DATA: 20.07 G @ 21.00 MS, 3.00 G @ 51.88 MS

ACCELERATION (G)

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

17-APR-03

TRC INC.

572F SN065 DAMPER TEST CAL08

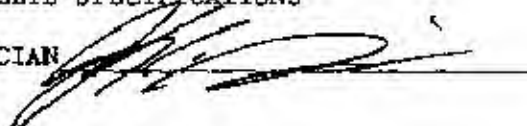
TEST NUMBERS: DP06508A, DP06508B, DP06508C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	38.0 %
VELOCITY	FORCE	683 - 944 N	840 N
2.78 M/S	DISPLACEMENT	29.8 - 34.6 MM	32.2 MM
VELOCITY	FORCE	1733 - 2100 N	2005 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	34.4 MM
VELOCITY	FORCE	3824 - 4542 N	4040 N
6.14 M/S	DISPLACEMENT	33.3 - 39.6 MM	38.4 MM

DAMPER SETTING = 5.5

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 041703.1401;1

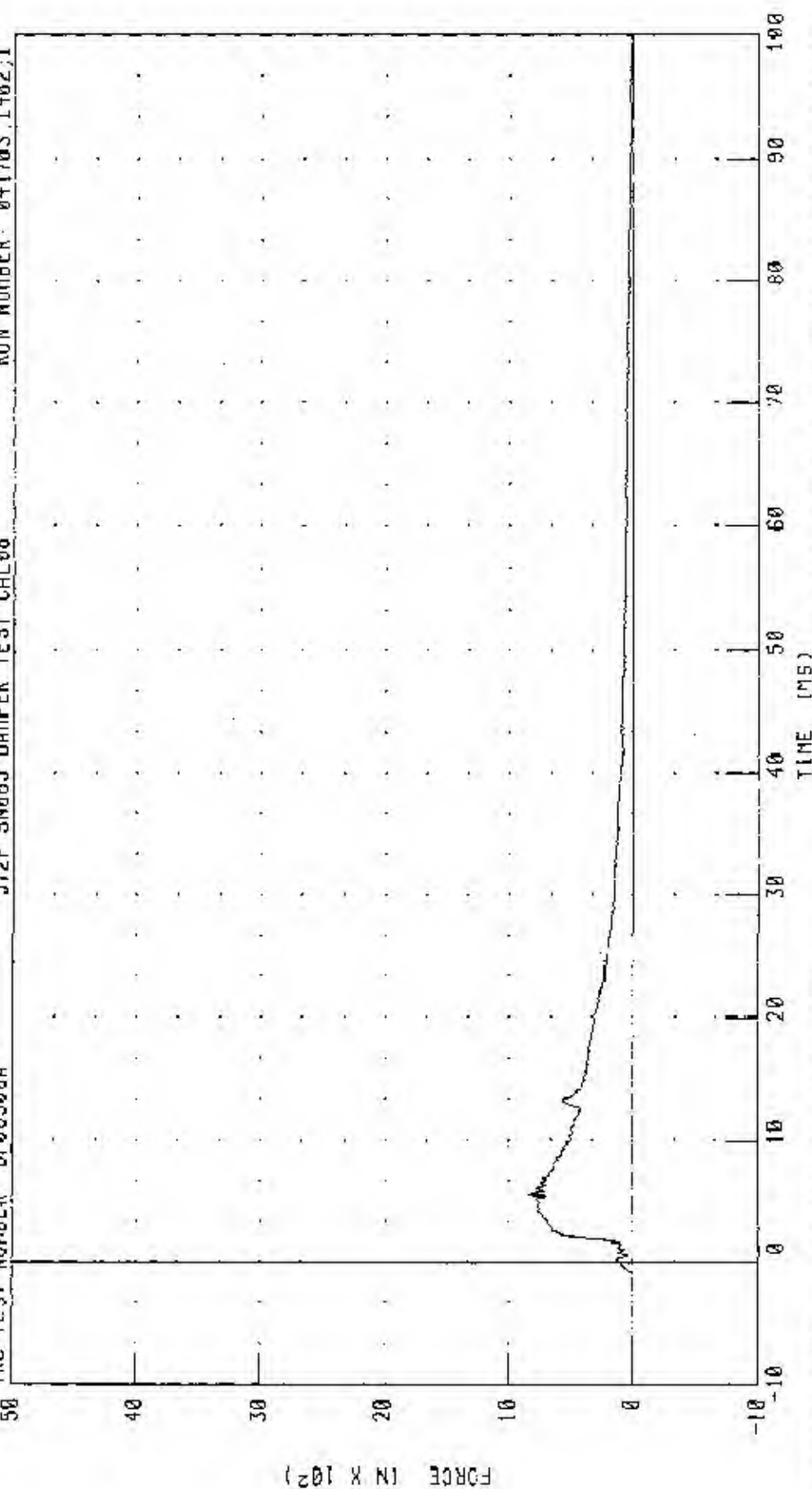
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 N/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06508A

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402.1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 839.51 N @ 5.60 MS; -1.68 N @ -0.64 MS

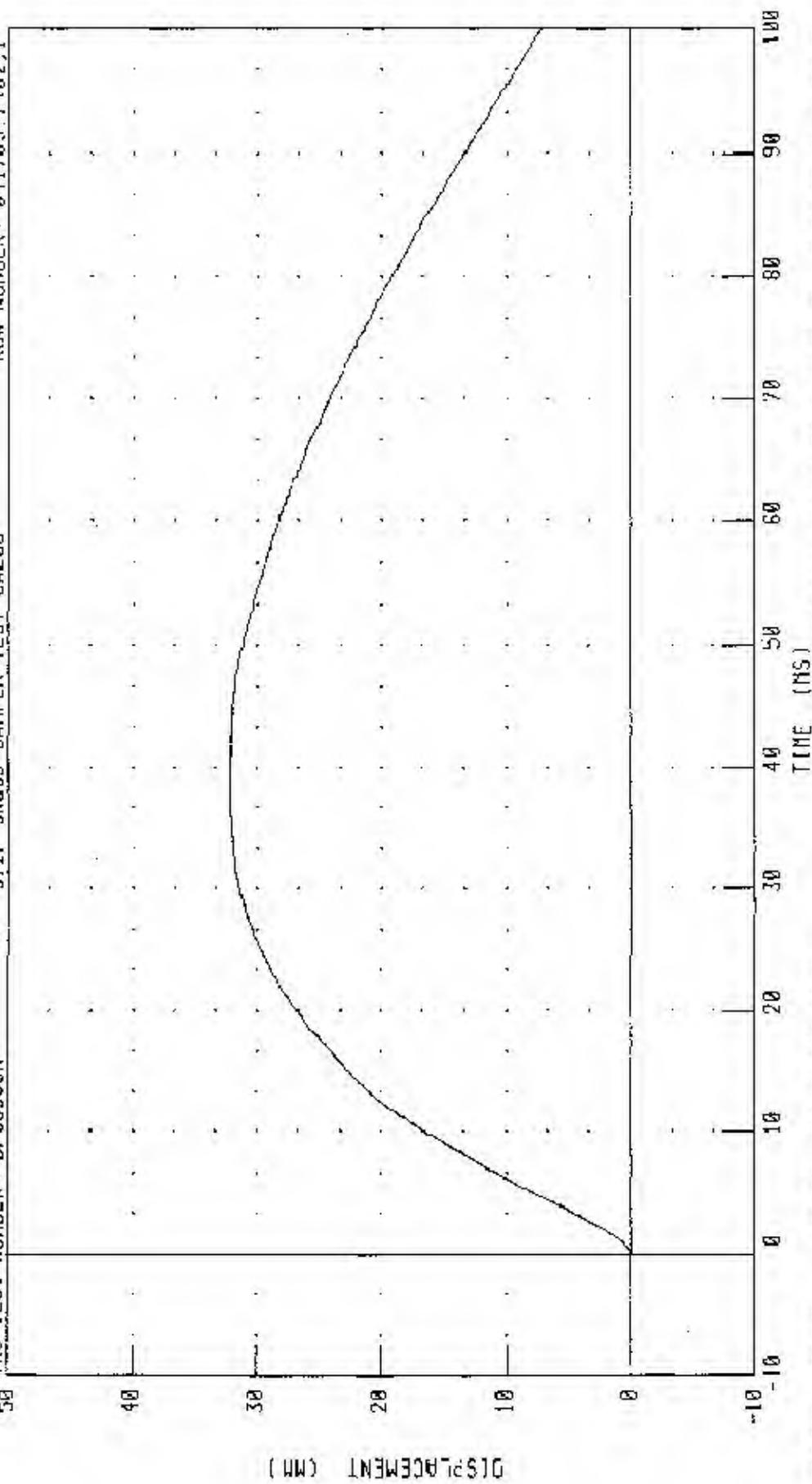
PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC.)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06508A

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402.1



CHANNEL: CSTYO FILTER: CH. CLASS 1000

PEAK DATA: 32.15 MM @ 30.00 MS, 0.00 MM @ 3.04 MS

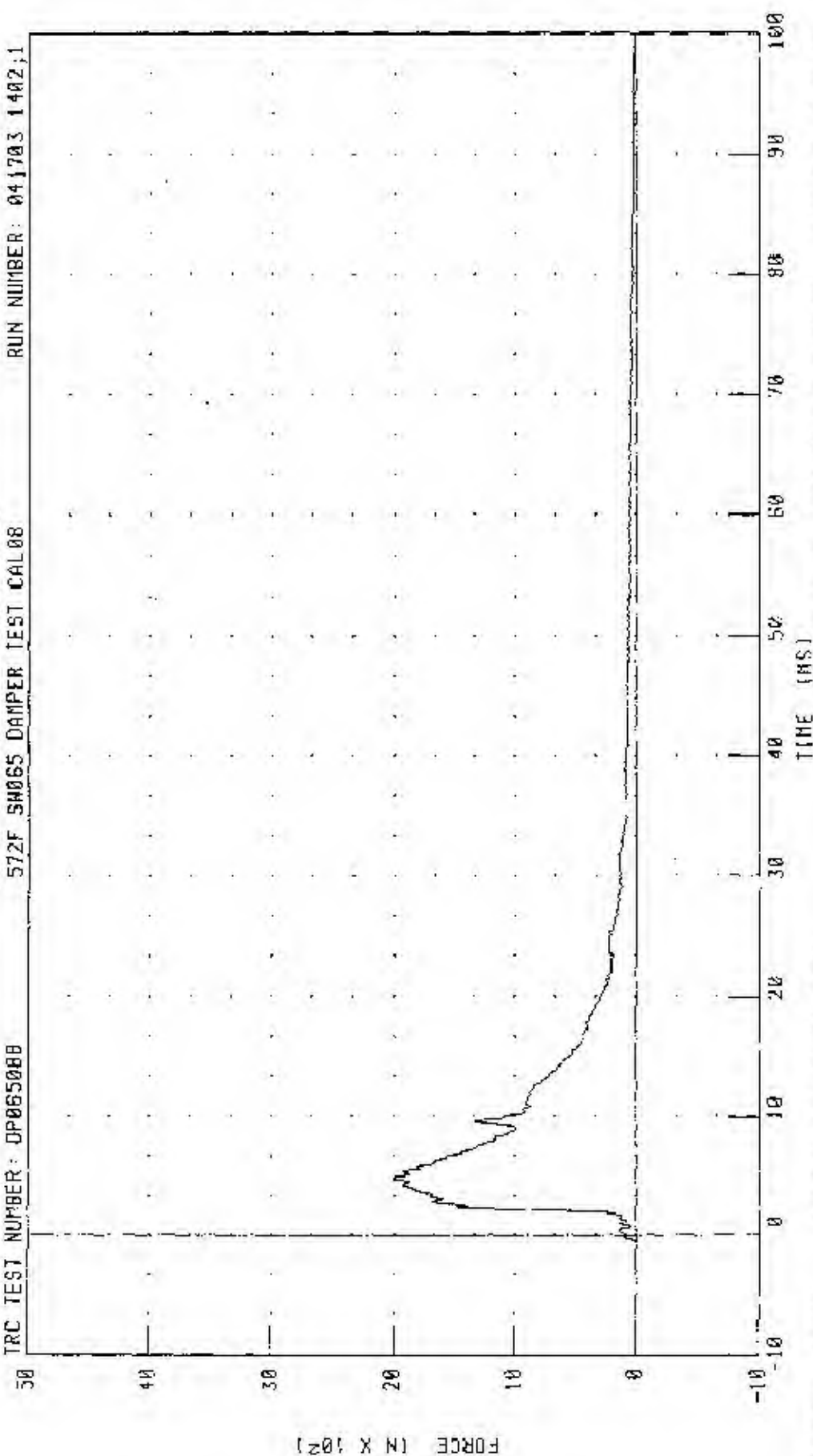
PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP065088

572F SHOCK DAMPER TEST CAL08

RUN NUMBER: 041703 1402;1



CHANNEL: DAMPF FILTER: CH CLASS 1200

PEAK DATA: 2004 54 N @ 1.88 MS: -2.26 N @ -5.80 MS

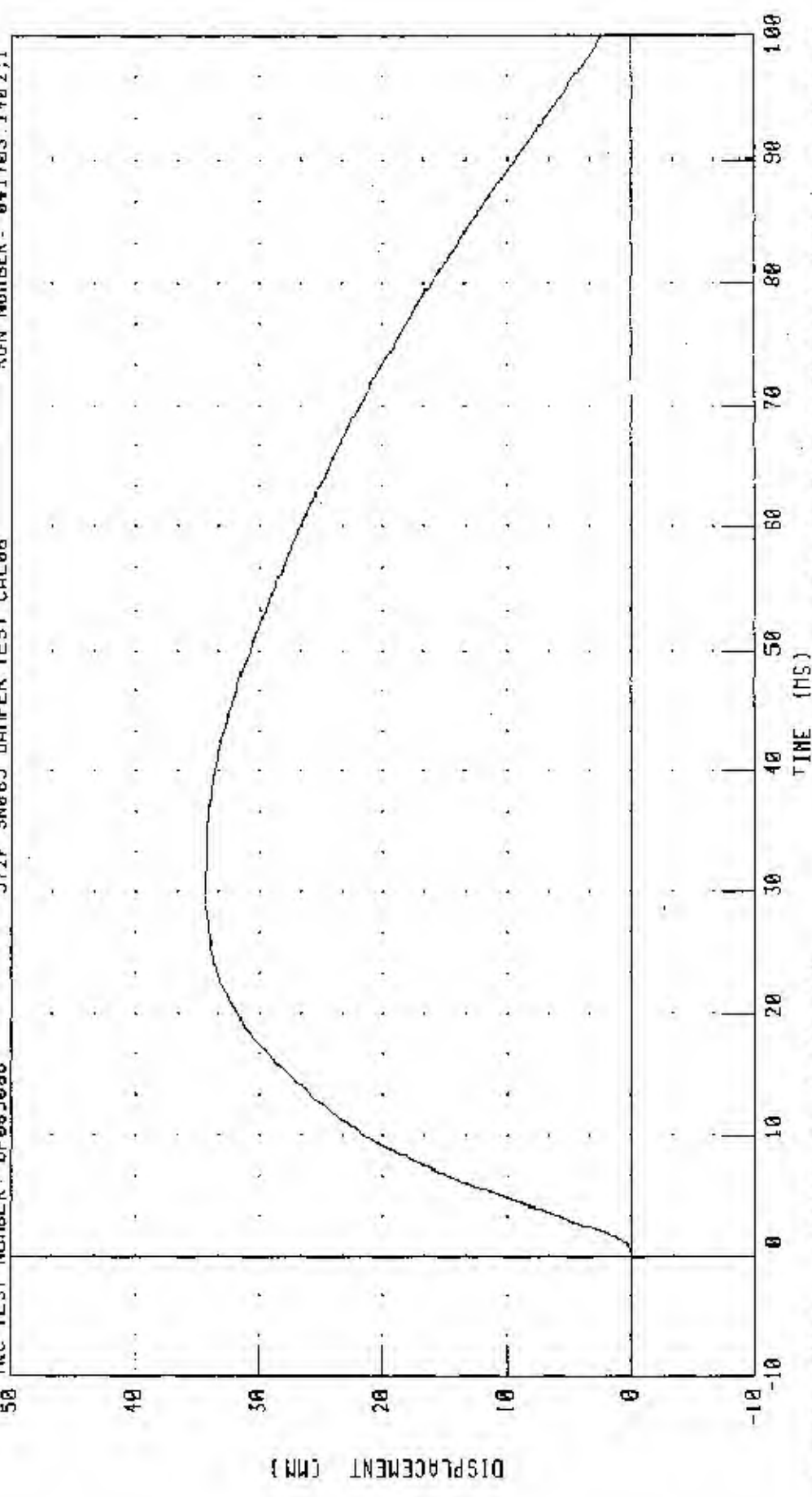
PART 572-F S.I.D., THORACIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP065088

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402.1



CHANNEL: CSTYD FILTER: CH. CLASS 1000

PEAK DATA: 34.36 MS @ 30.64 MS; 0.00 MM @ -9.52 MS

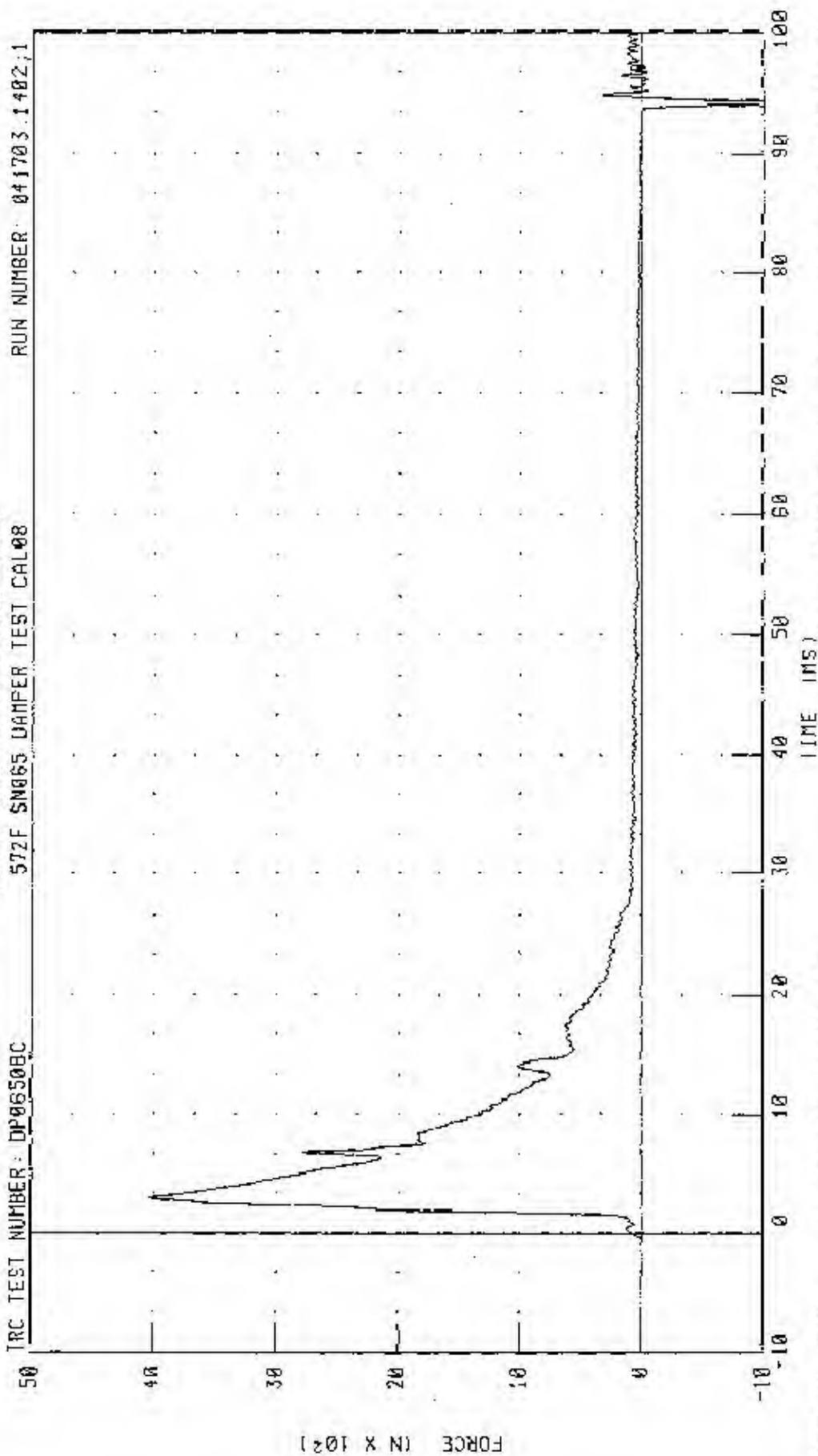
PAR1 572-F S I.D. 1-HYDRAULIC SHOCK ABSORBER CALIBRATION (6.1 N/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP0650BC

572F SN065 DAMPER TEST CAL08

RUN NUMBER: 041703.1402.1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA 4040.25 N 0 3 04 MS, -2244.23 N 0 91.08 MS

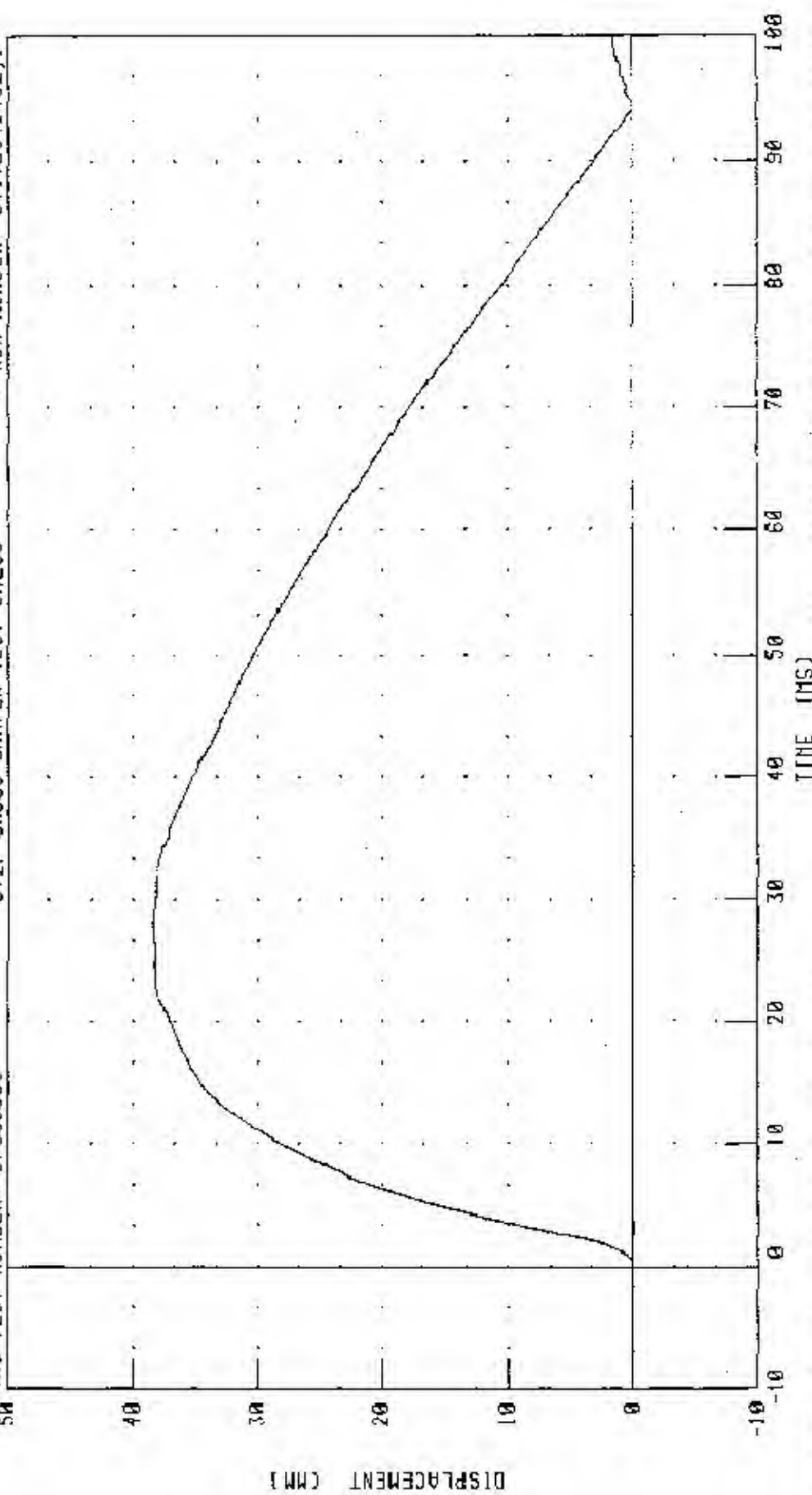
PART 572-F 5.10 THORACIC SHOCK ABSORBER COLIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06508C

572F 5N065 DAMPER TEST CAL08

RUN NUMBER 041703 1402.1



CHANNEL: CSTYD FILTER: CH. CLASS 1000

PEAK DATA 38.39 MM @ 27.84 MS; -0.02 MM @ 94.40 MS

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST


SID PART 572B

CAL DATE: 25-Apr-03

TRC, INC. TEST NO: 065C09TF1 572B SN 065 TORSO FLEX CAL 09

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 °C	21.1 °C
RELATIVE HUMIDITY	10 - 70 %	25 %
FORCE AT 0 DEG. FLEXION	-27 - 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 - 151 N	124.6 N
FORCE AT 30 DEG OF FLEXION	151 - 205 N	164.6 N
FORCE AT 40 DEG OF FLEXION	205 - 258 N	218 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	9 °

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572B Abdomen Compression Test

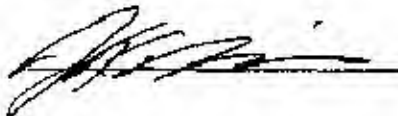
HIH SID Serial No. 065 Calibration No. 09 - 1

Test Date 04/25/2003

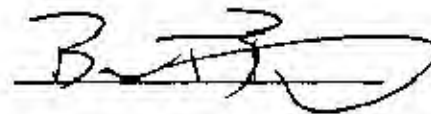
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.3 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.25.2003 10:38:12 97

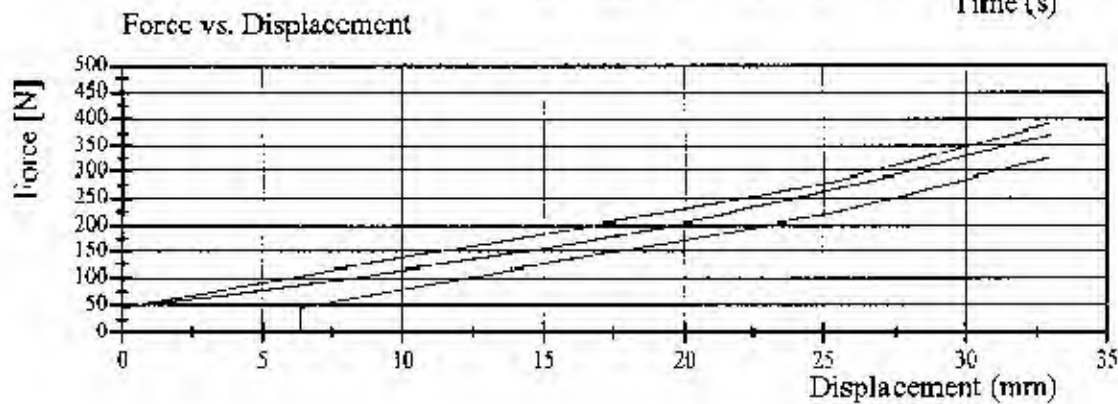
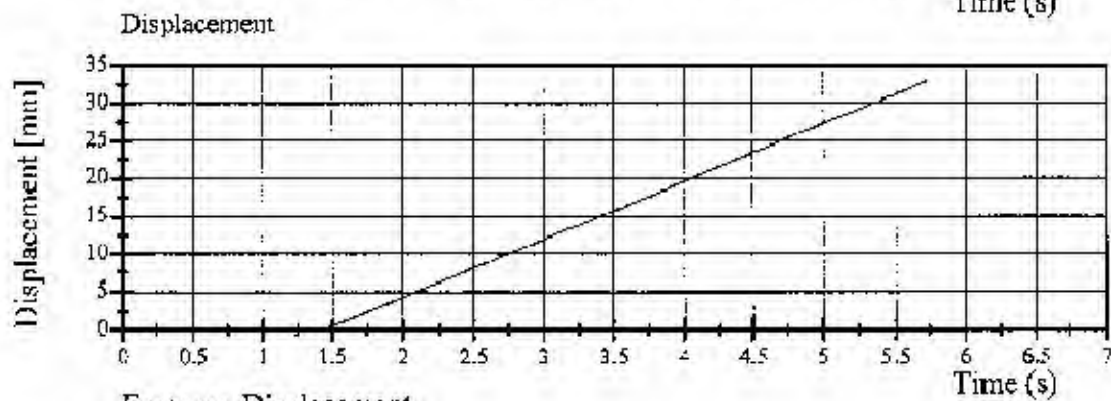
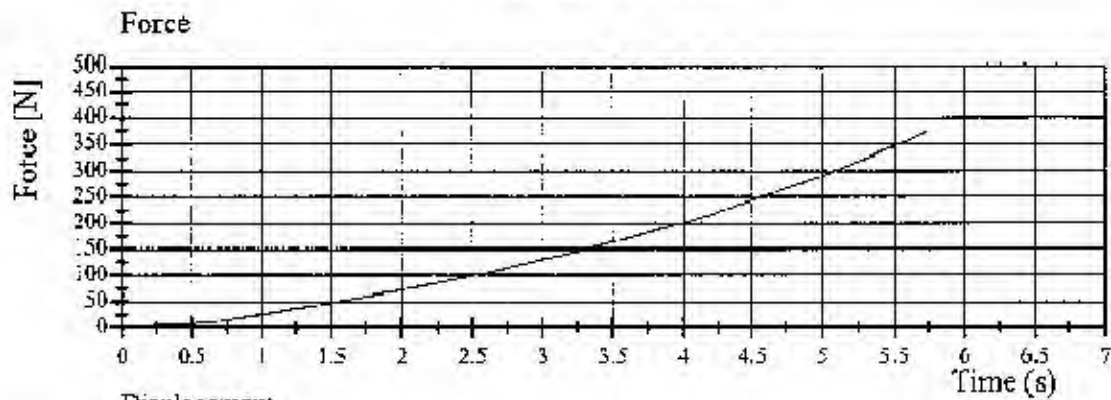


Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 065 Calibration No. 09 - 1

Test Date 04/25/2003



04.25.2003 10:38:13 97



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

25-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL06509

572F SN065 LEFT PELVIS CAL09

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	25.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	50.9 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.0 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042503.0934;1

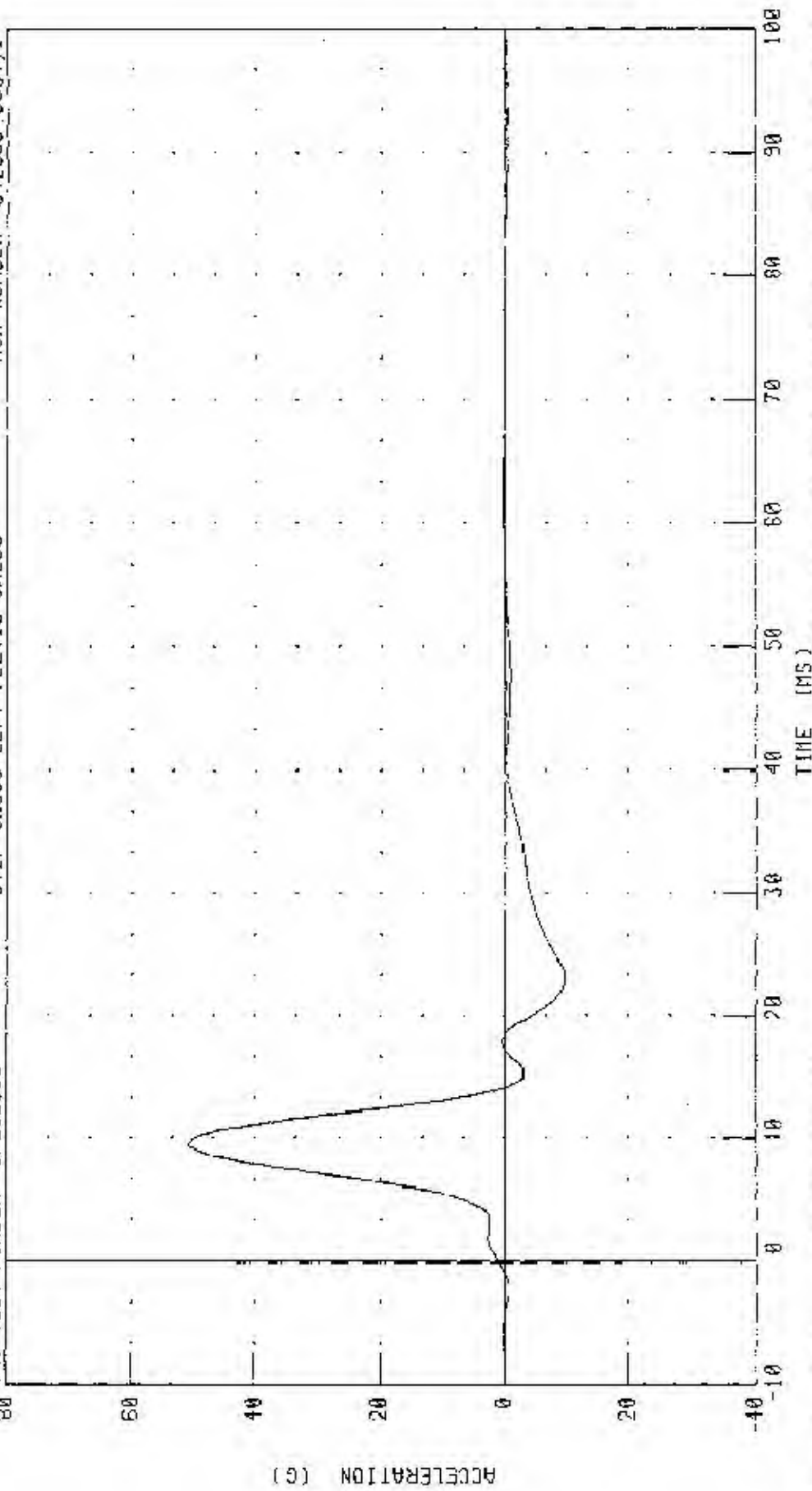
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

572F SM865 LEFT PELVIS CAL89

TRC TEST NUMBER: SPL06509

RUN NUMBER: 042503 0934.1



TIME (MS)

CHANNEL: PEVYU

FILTER: FIR 100

PEAK DATA: 50.85 G @ 9.37 MS; -9.77 G @ 23.13 MS

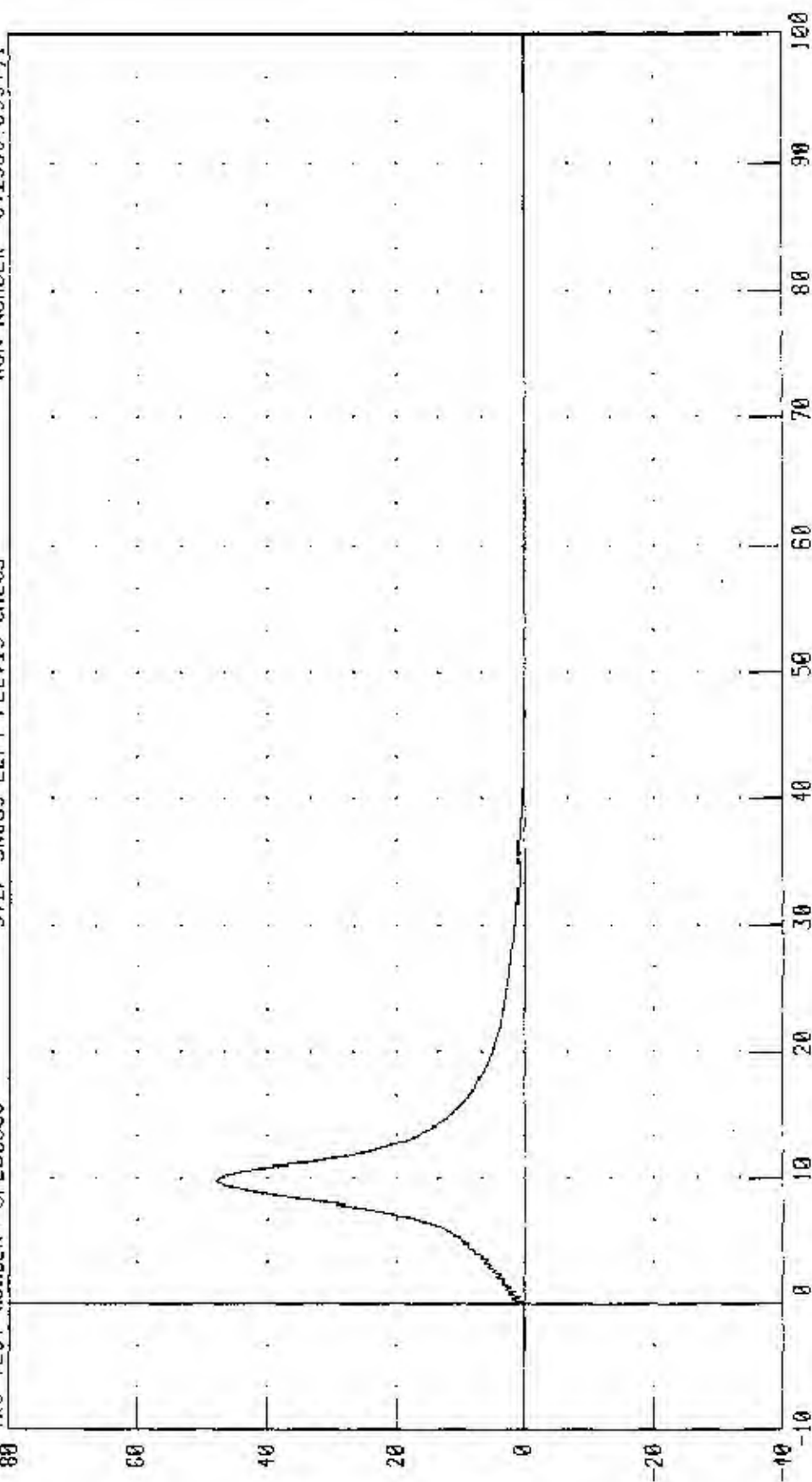
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

IRC TEST NUMBER: SPL06509

572F SN065 LEFT PELVIS COL08

RUN NUMBER: 042503.0934.1



ACCELERATION (G)

TIME (MS)

CHANNEL: PENXC FILTER: CH CLASS 1000

PEAK DATA: 47.35 G @ 9.84 MS, -0.28 G @ 61.52 MS

Calibration Test Results

Post-Test

SID: 028

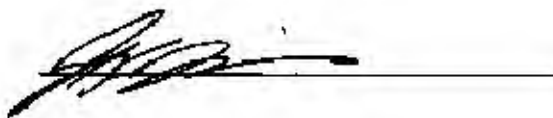
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 028 Calibration No. 06

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	895 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	504 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	230 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	512 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	372 mm	Yes
Top Rib Width From CVL	RW-1	165.1 - 180.3 mm	169 mm	Yes
Bottom Rib Width From CVL	RW-2	165.1 - 180.3 mm	168 mm	Yes
Difference Between Top & Bottom Rib Width from CVL		≤ 2.5 mm	1.0 mm	Yes

Technician



Approved



TRE

TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDIII SID DUMMY

01-MAY-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL02806

572M SID/HIII SNO28 HEAD CAL06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	43.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	135.13 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-6.54 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 050903.1449;1

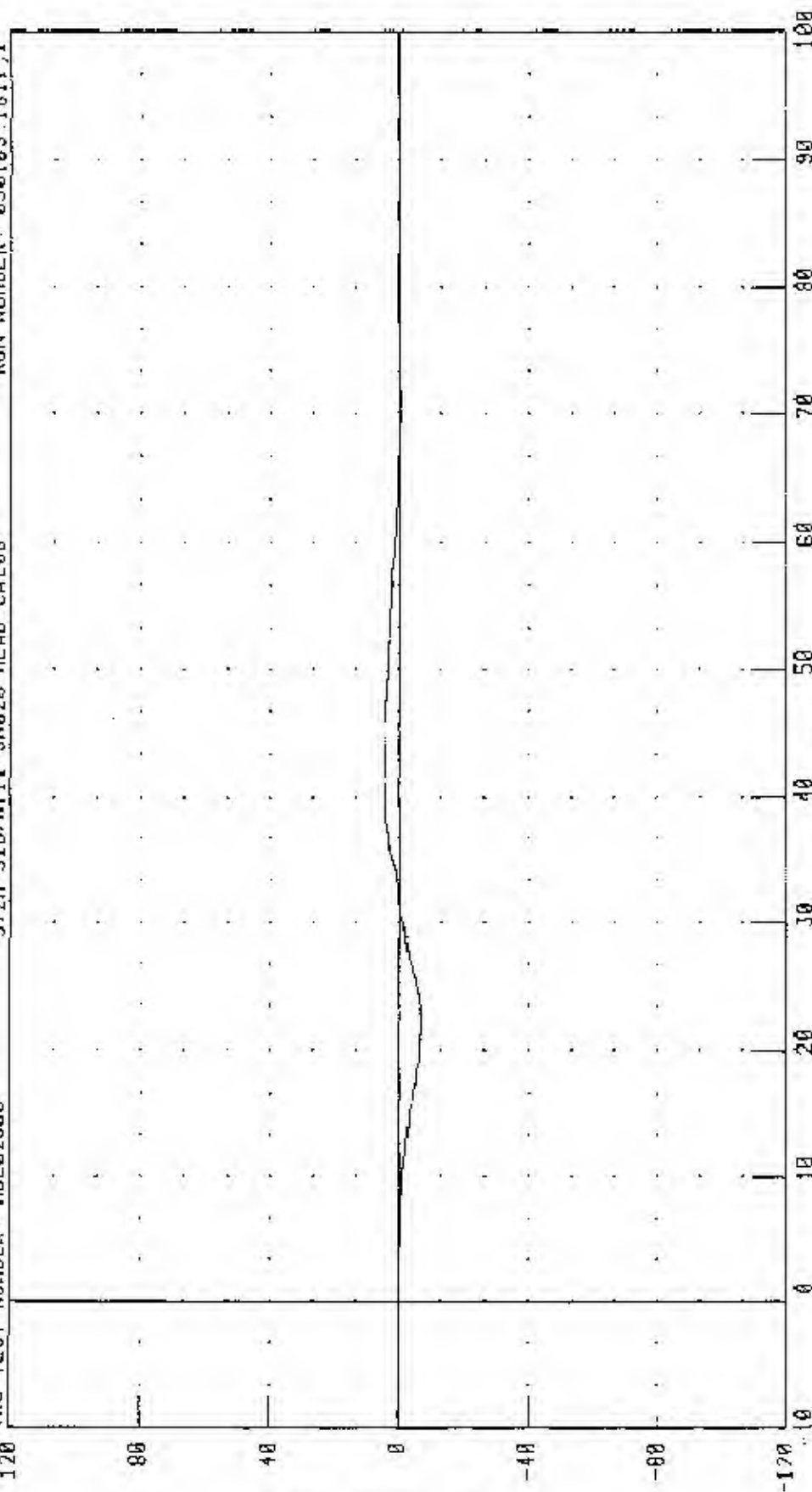
572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL02806

572M SID/HILL SN028 HEAD CAL06

RUN NUMBER: 050103.1611.1



TIME (MS X 10⁻¹)

PEAK DATA: 4 61 0 0 4 56 MS, -6.54 G @ 2 16 MS

CHANNEL HEDXC FILTER CH. CLASS 1000

ACCELERATION (G)

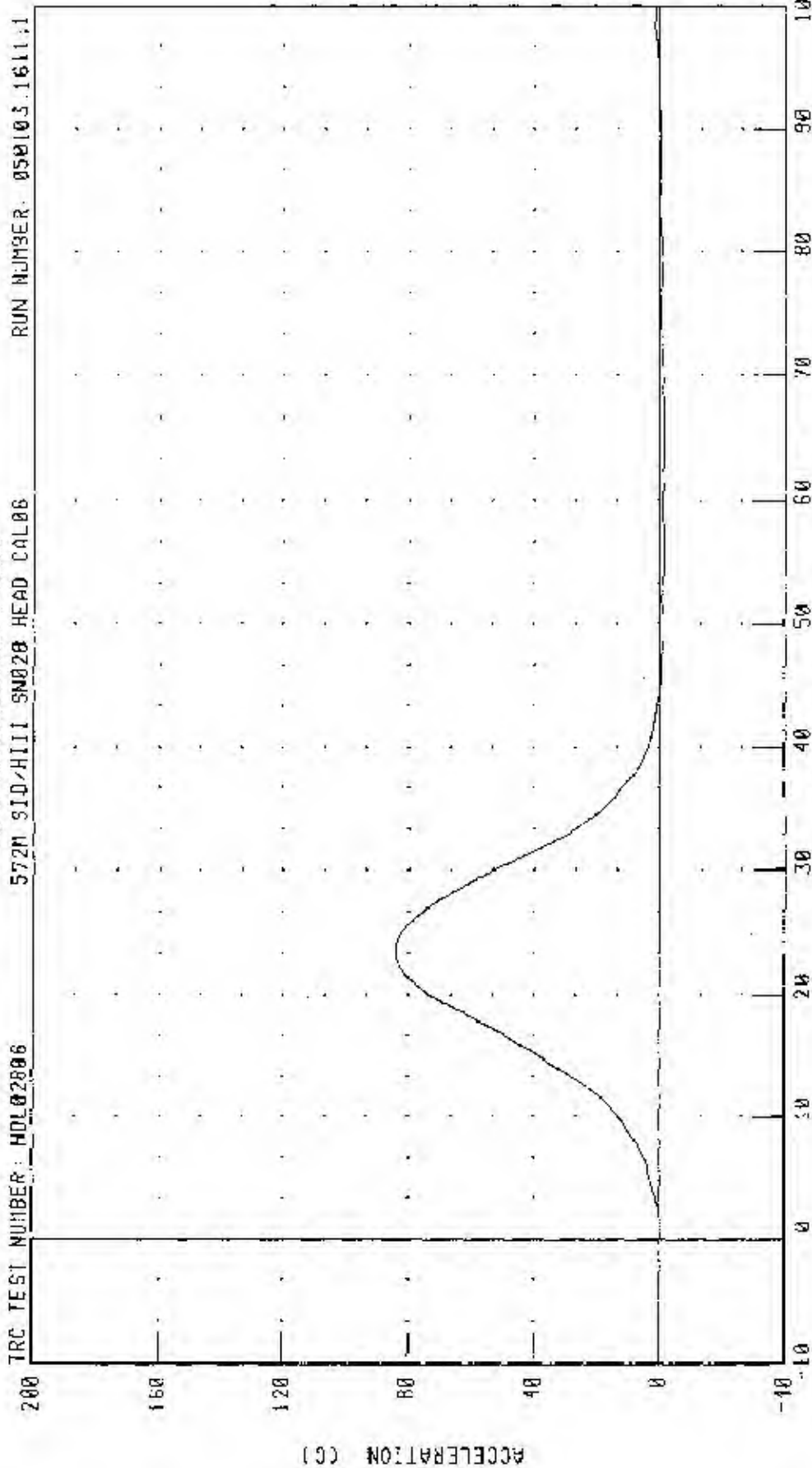
572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

RUN NUMBER: 050103.1611.1

572M SID/HILL SN020 HEAD CAL06

TRC TEST NUMBER: HDL02806



CHANNEL: HEDYG

FILTER: 011 CLASS: 1000

TIME (MS X 10⁻¹)

PEAK DATA: B4 H0 C 0 7 32 F S; -1 00 C 0 5.52 MS

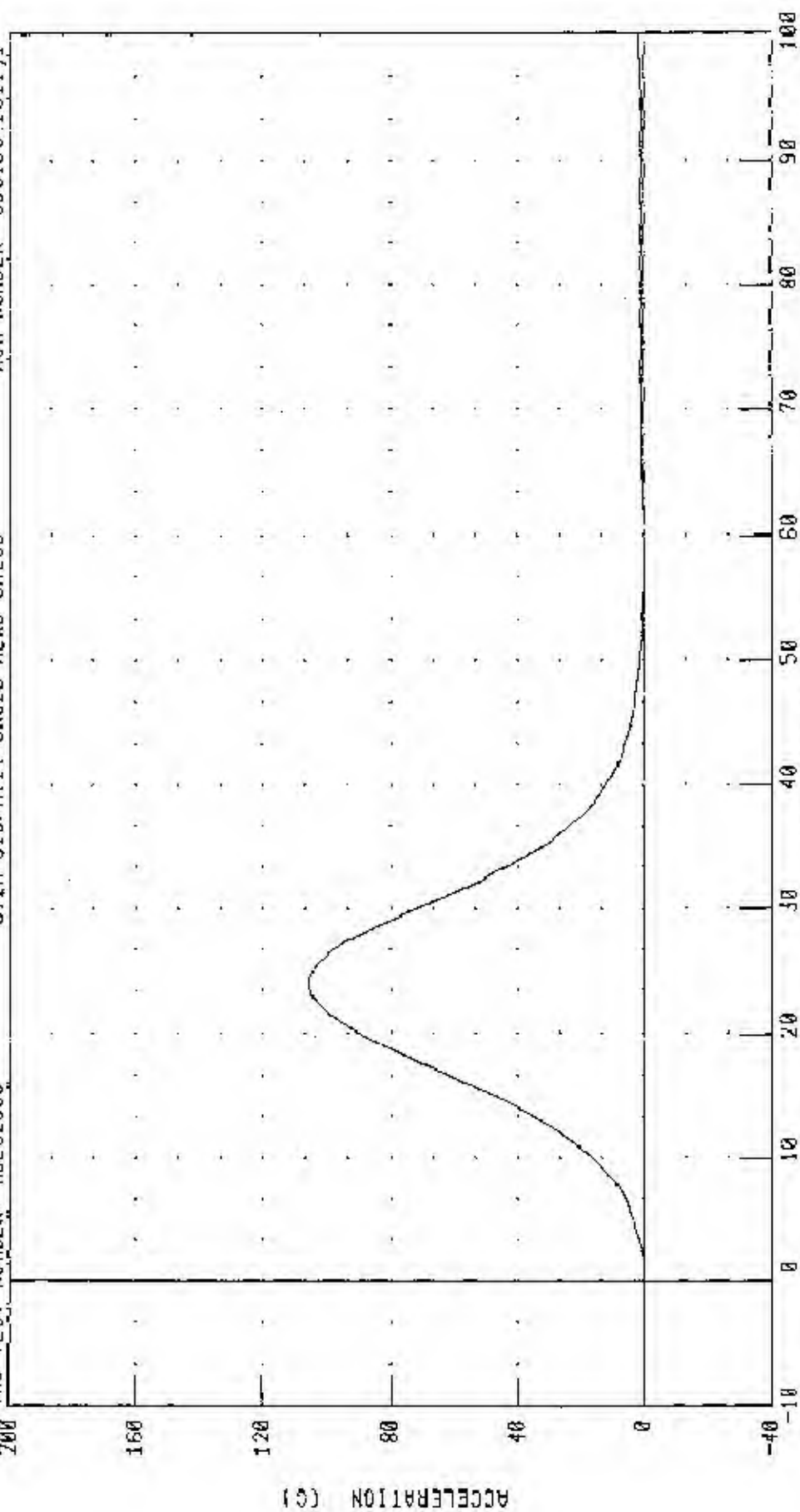
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEND ACCELERATION Z AXIS

TRC TEST NUMBER: HOL-02806

572M SID/HIII SN028 HEAD CAL08

RUN NUMBER 050103.1611,1



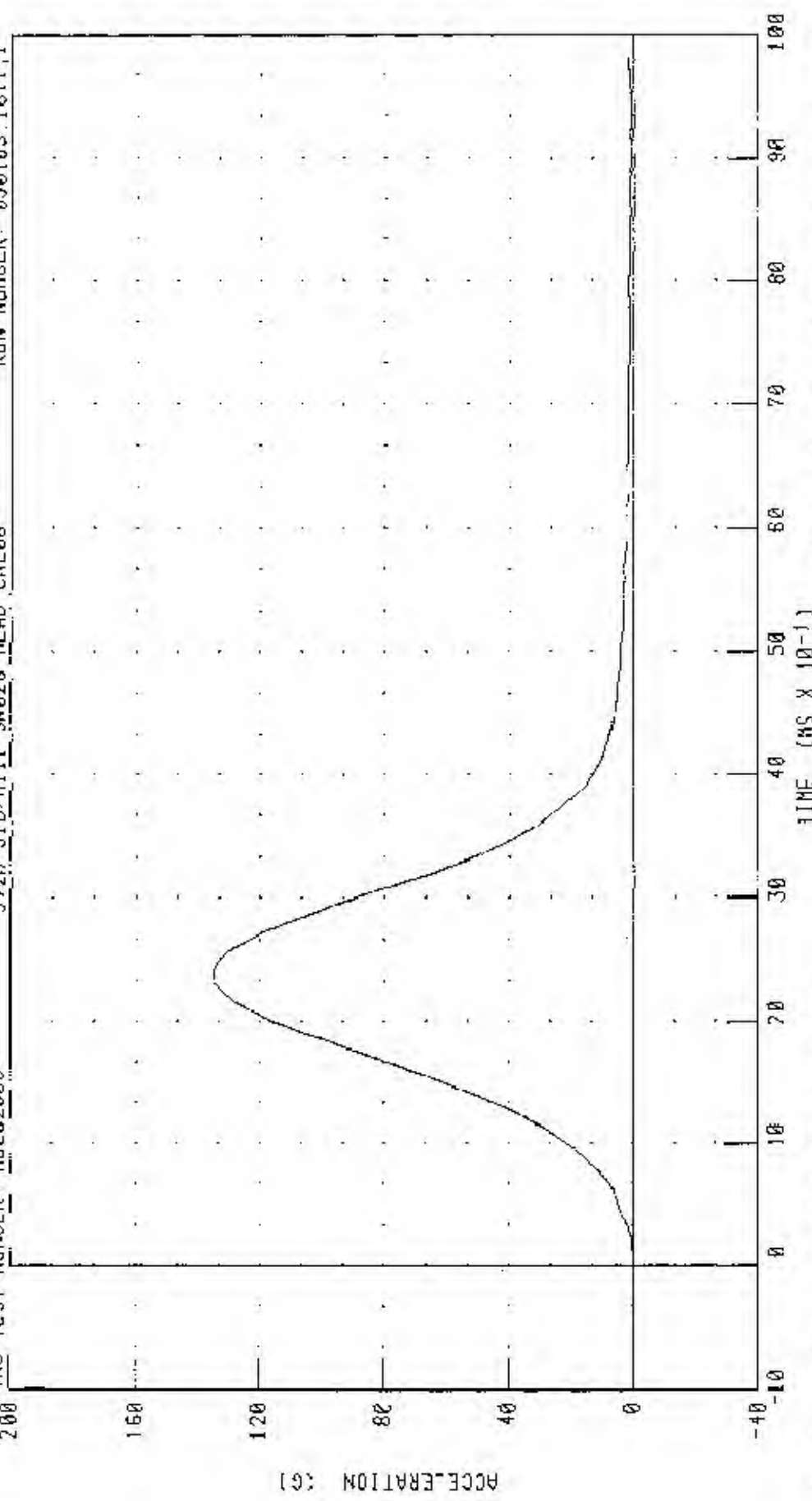
CHANNEL MEDZG FILTER: C11. CLASS 1000

PEAK DATA: 105.74 G @ 24.0 MS; -0.09 G @ 0.00 MS

572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEART DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: UDL02806 572M SID/HILL SN020 HEAD CAL06 RUN NUMBER: 050103.1611.1



CHANNEL: HEADG FILTER: CH. CLASS 1000 PLAK DATA: 135.13 G @ 2.40 MS, 0.03 G @ -0.56 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

01-MAY-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. NFL02806

572M H3/SID SN028 NECK CAL06

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY		10 - 70 %	43.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.35 M/S
	20 MS	4.12 - 5.10 M/S	4.80 M/S
	30 MS	5.73 - 7.01 M/S	6.85 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.11- 7.19 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	71.81 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	58.88 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	79.19 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	56.32 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.88 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 050903.1452;1

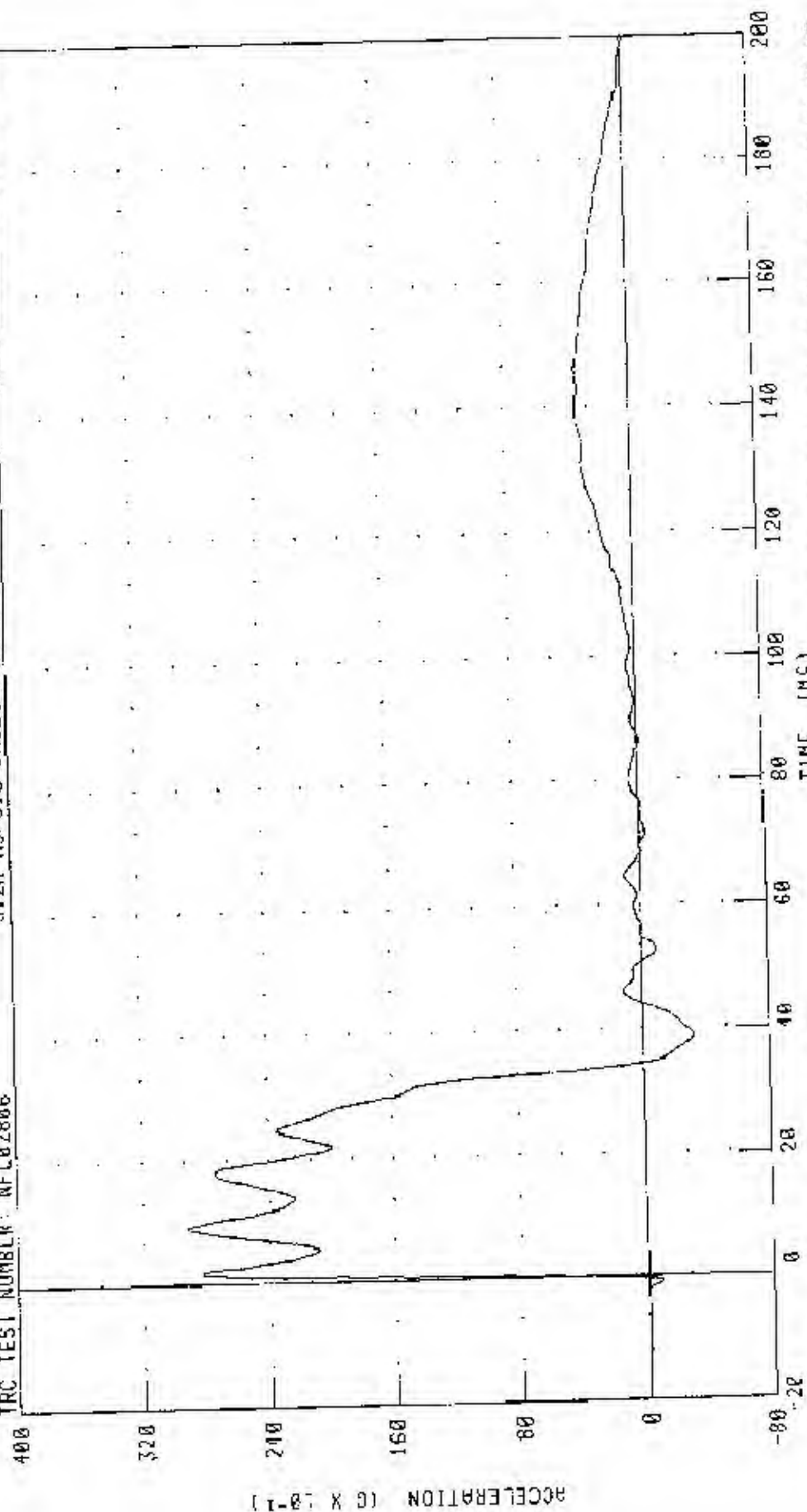
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

RUN NUMBER 050103.1845.1

572M H3/SID SN028 NECK CAL08

TRC TEST NUMBER: NFL02806



TIME (MS)

PEAK DATA: 29 16 0 9.20 MS, -5.22 0 0 38 88 MS

CHANNEL: PENXC FILTER: CH. CLASS 100

ACCELERATION (G X 10^-1)

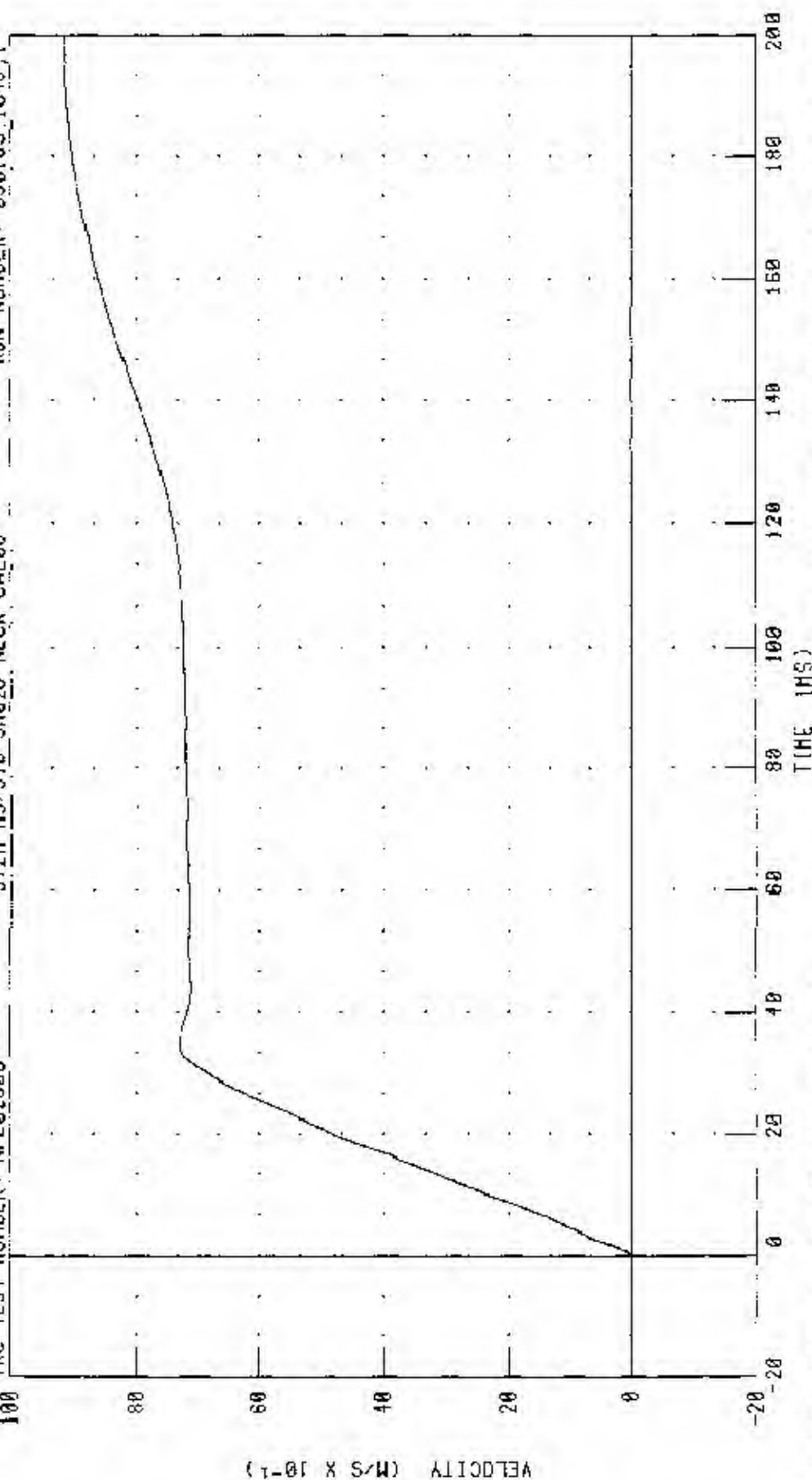
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER: NFIQ2806

572M H3/SID SN028 NECK CAL06

RUN NUMBER: 050103.1015.1



CHANNEL: PENXXVI FILTER: CH. CLASS 180

PEAK DATA: 9.13 M/S @ 197.92 MS; -0.01 M/S @ -0.10 MS

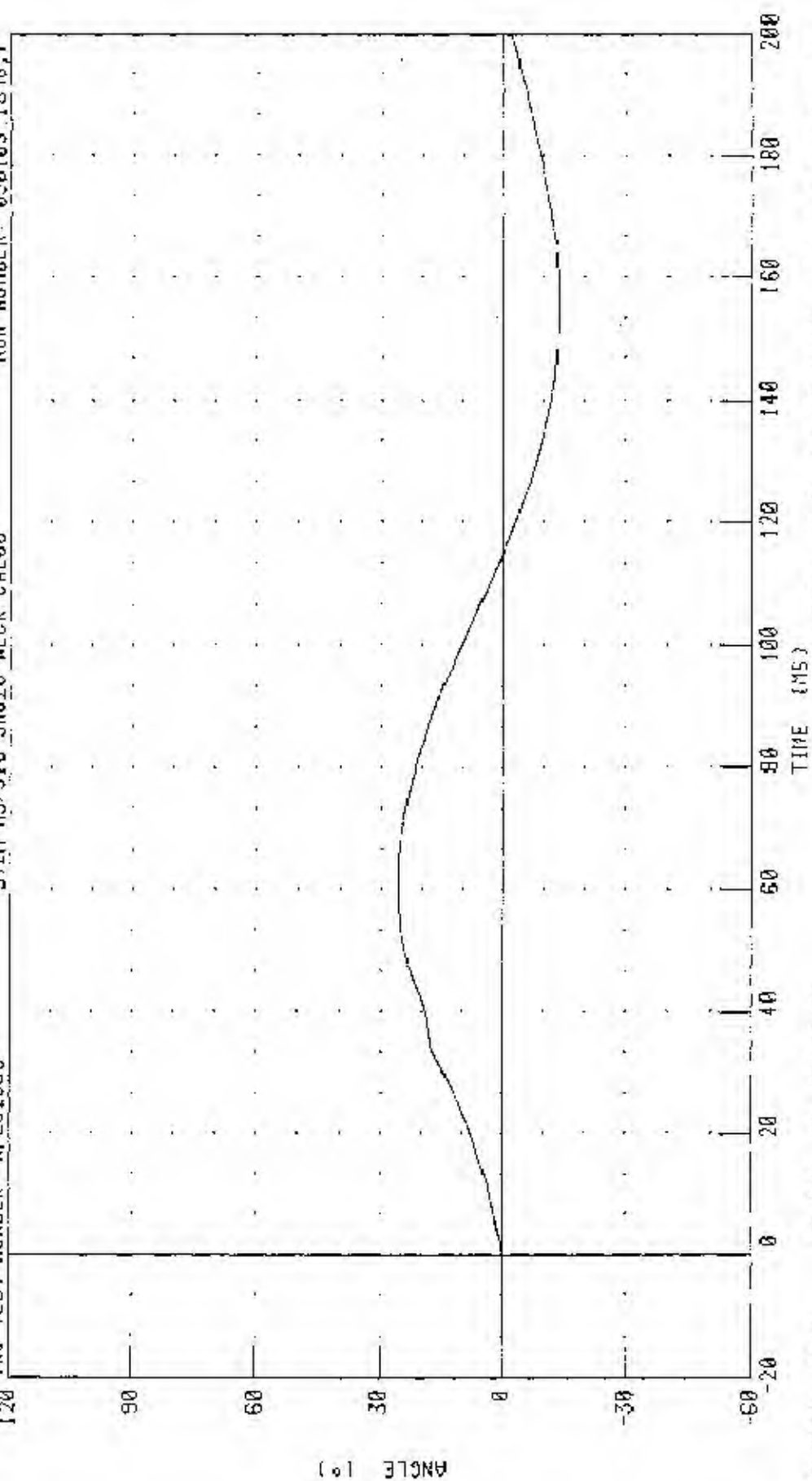
572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL02806

572M H3/S10 SN028 NECK CAL06

RUN NUMBER: 050103.1846.1



TIME (MS)

PEAK DATA: 25.5% @ 63.44 MS; 13.75 @ 156.00 MS

CHANNEL: BF10 FILTER: CH. CLASS 60

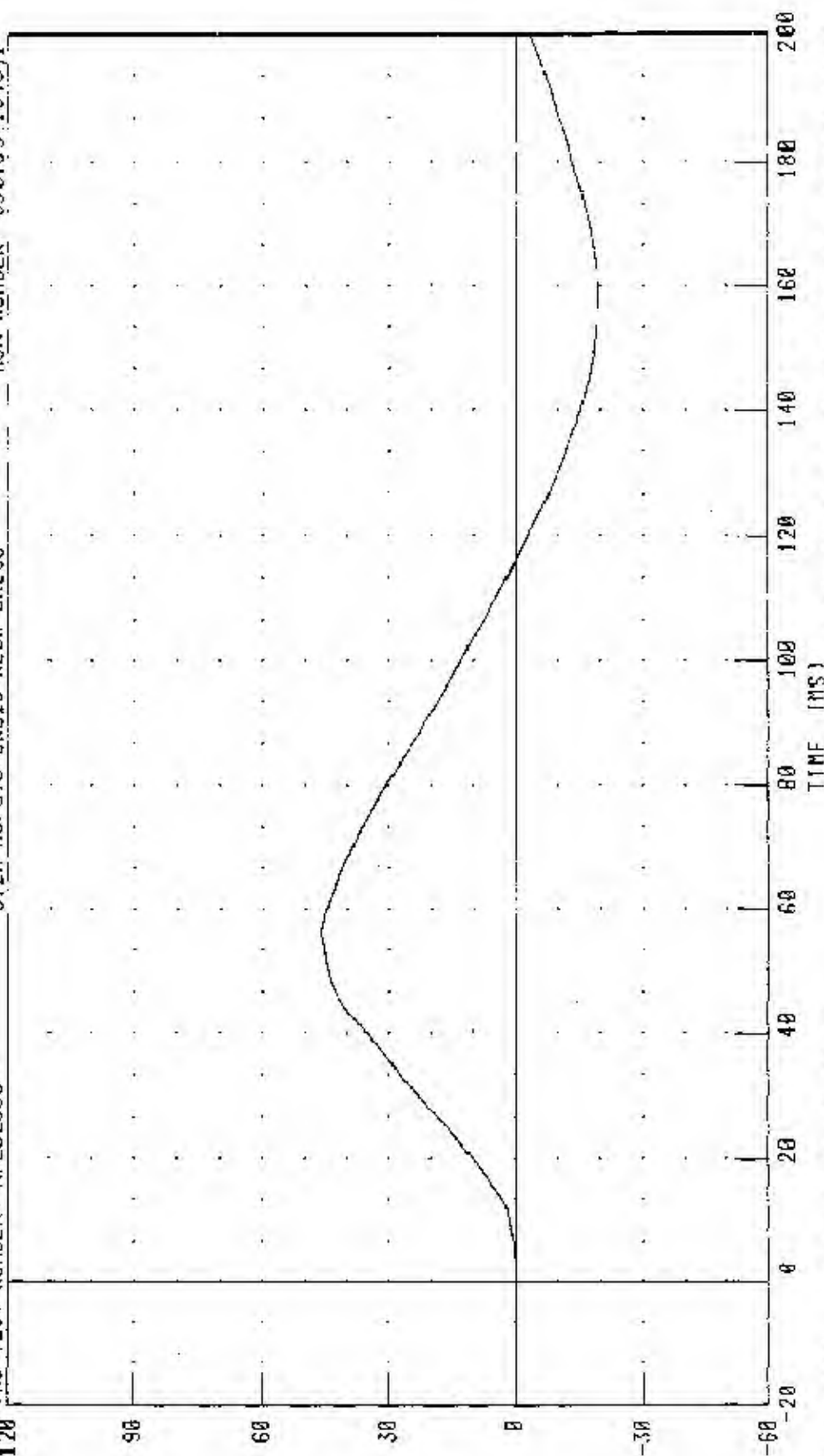
572H H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL02806

572H H3/SID SN928 NECK CAL06

RUN NUMBER: 050103 1816J1



PEAK DATA: 45.34 ° @ 56.32 MS; -138.31 ° @ 138.64 MS

CHANNEL: THETA FILTER: CH. CLASS 60

ANGLE (°)

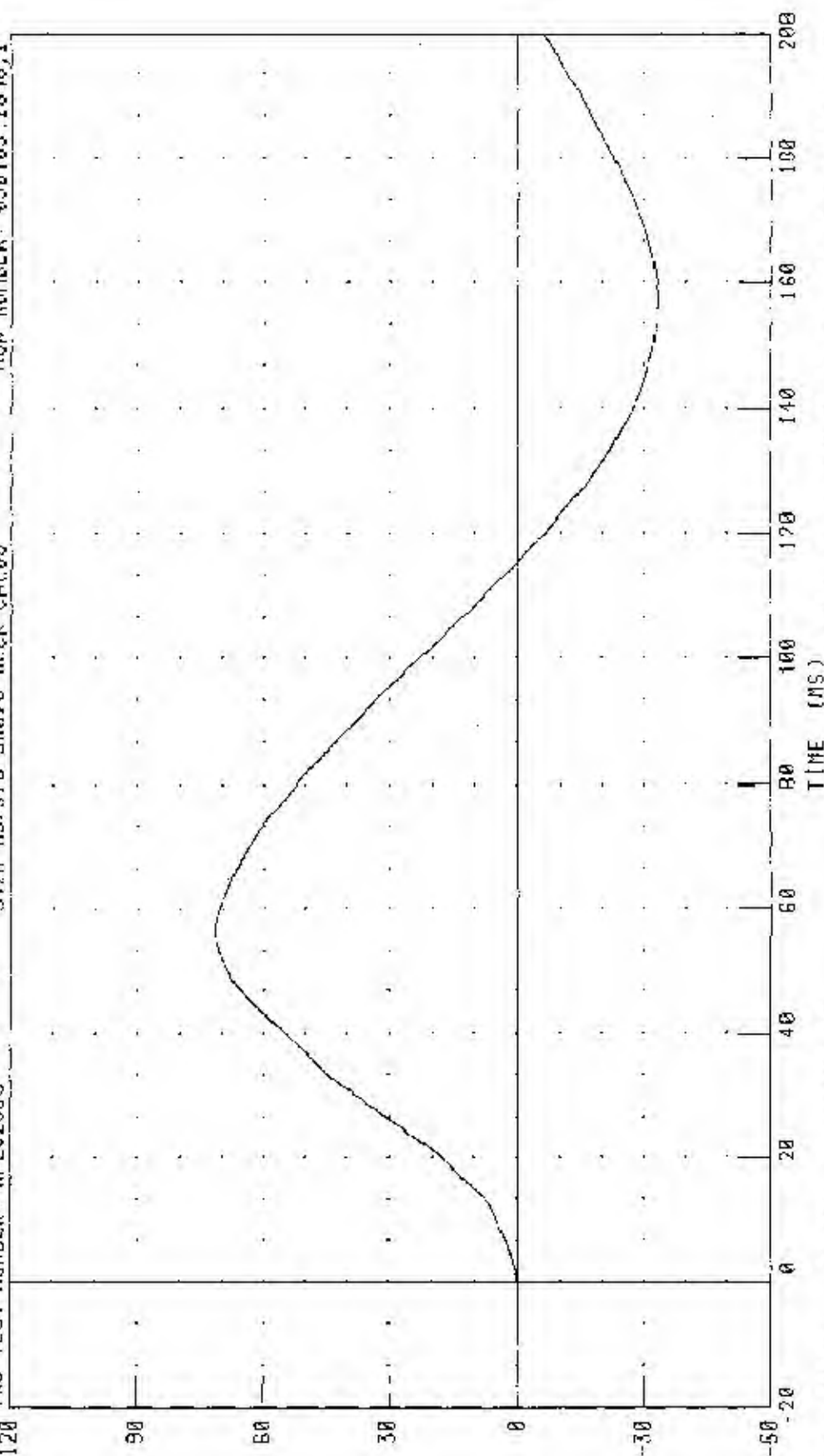
572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL02806

572M H3/S10 SN028 NECK CAL08

RUN NUMBER: 050103.1846.1



PEAK DATA: 71.81 ° @ 56.56 MS; -33.03 ° @ 157.52 MS

CHANNEL: TOTON FILTER CH. CLASS 60

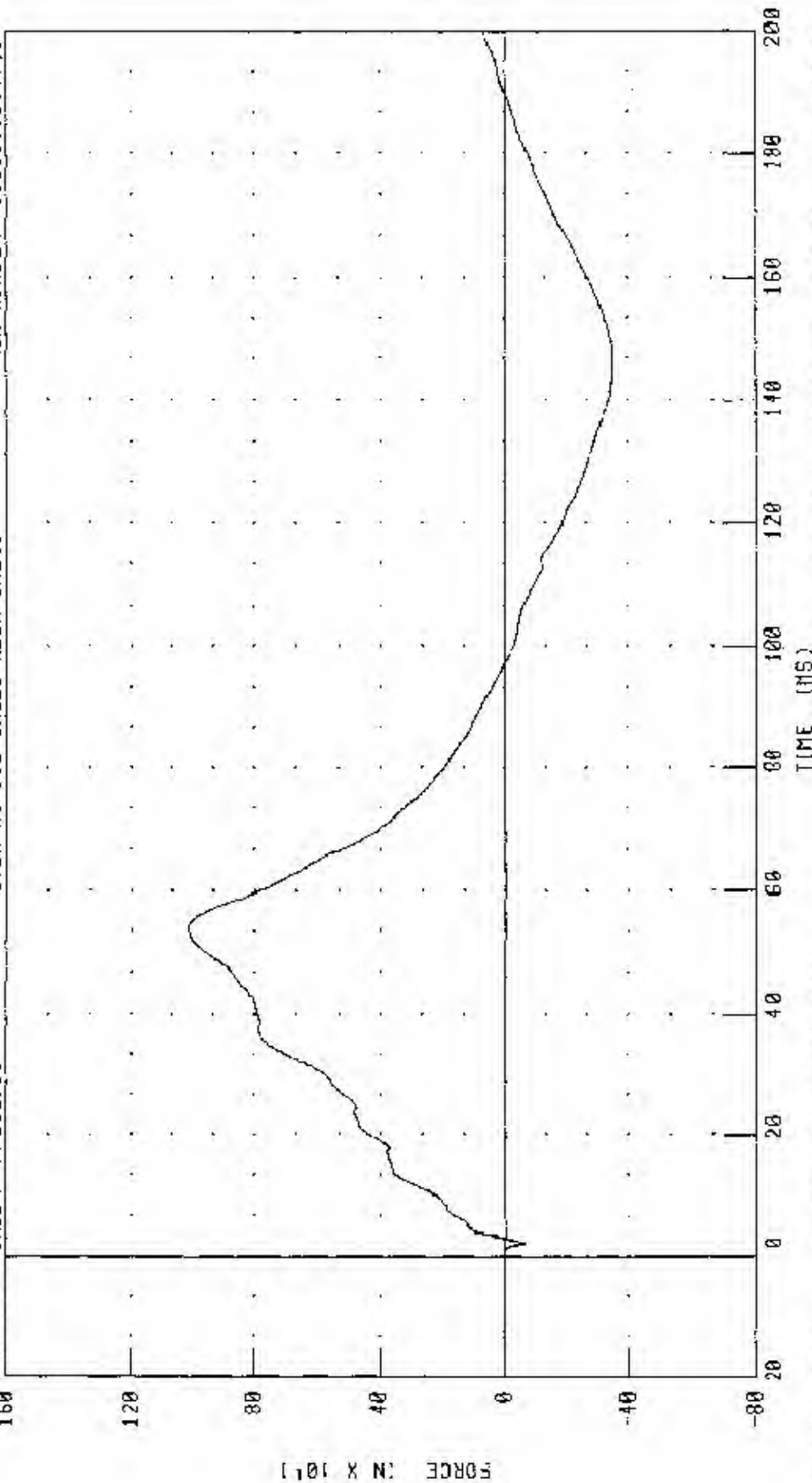
572M H3/SID BUNNY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC IFST NUMBER: NFL02006

572M H3/SID SN028 NECK CAL06

RUN NUMBER: 050103.1848.1



TIME (MS)

CHANNEL NEKVF FILTER-CH CLASS 1000

PEAK DATA: 1015 53 N @ 53 52 MS, -350.20 N @ 145 28 MS

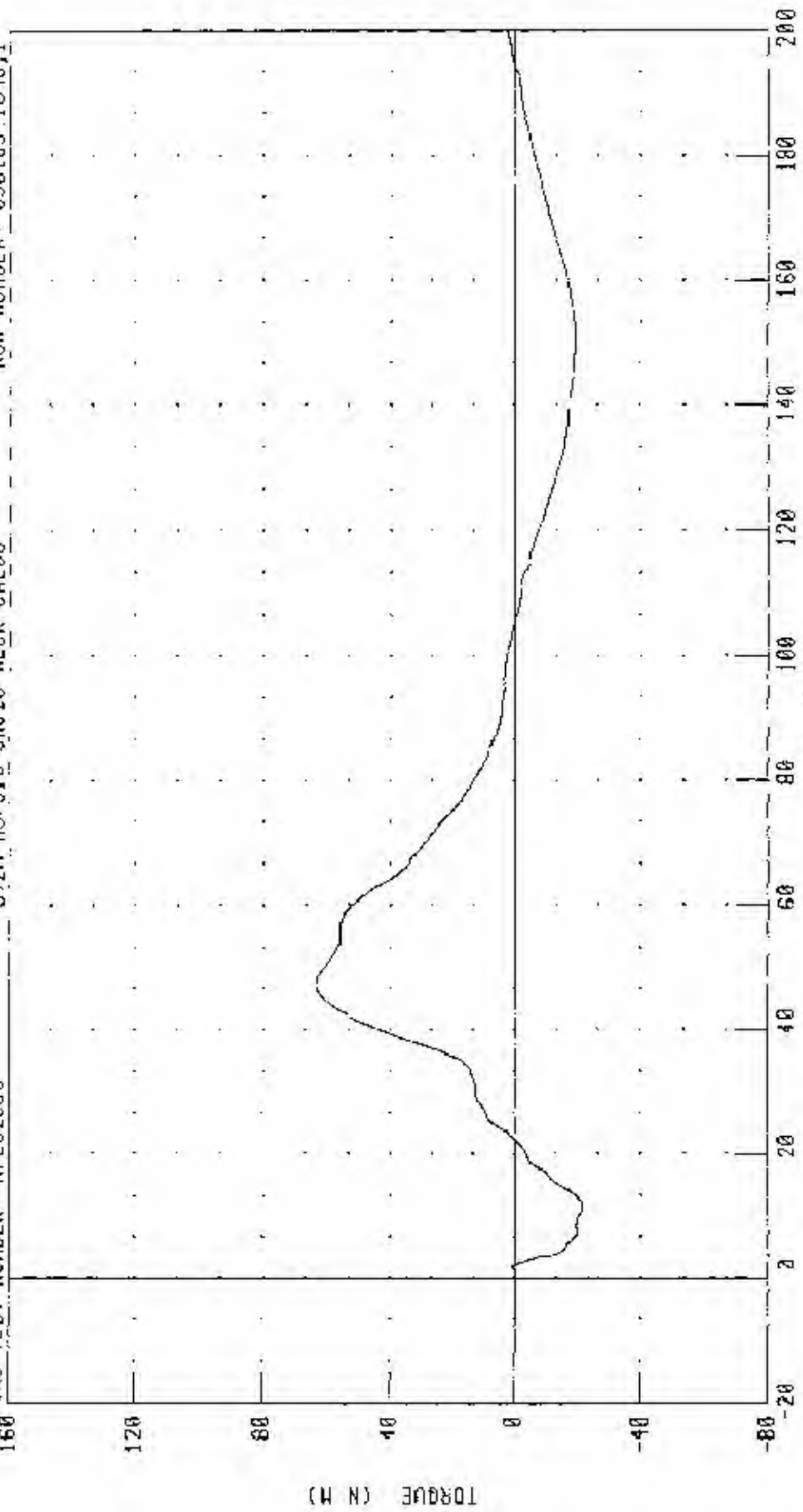
572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

IRC TEST NUMBER: NFL02806

572M H3/S10 SN028 NECK CAL06

RUN NUMBER: 050103 1046.1



TIME (MS)

PEAK DATA: 63.35 N.M @ 47.38 MS; -21.84 N.M @ 114.4 MS

CHANNEL: NEKXN FILTER: CH. CLASS 600

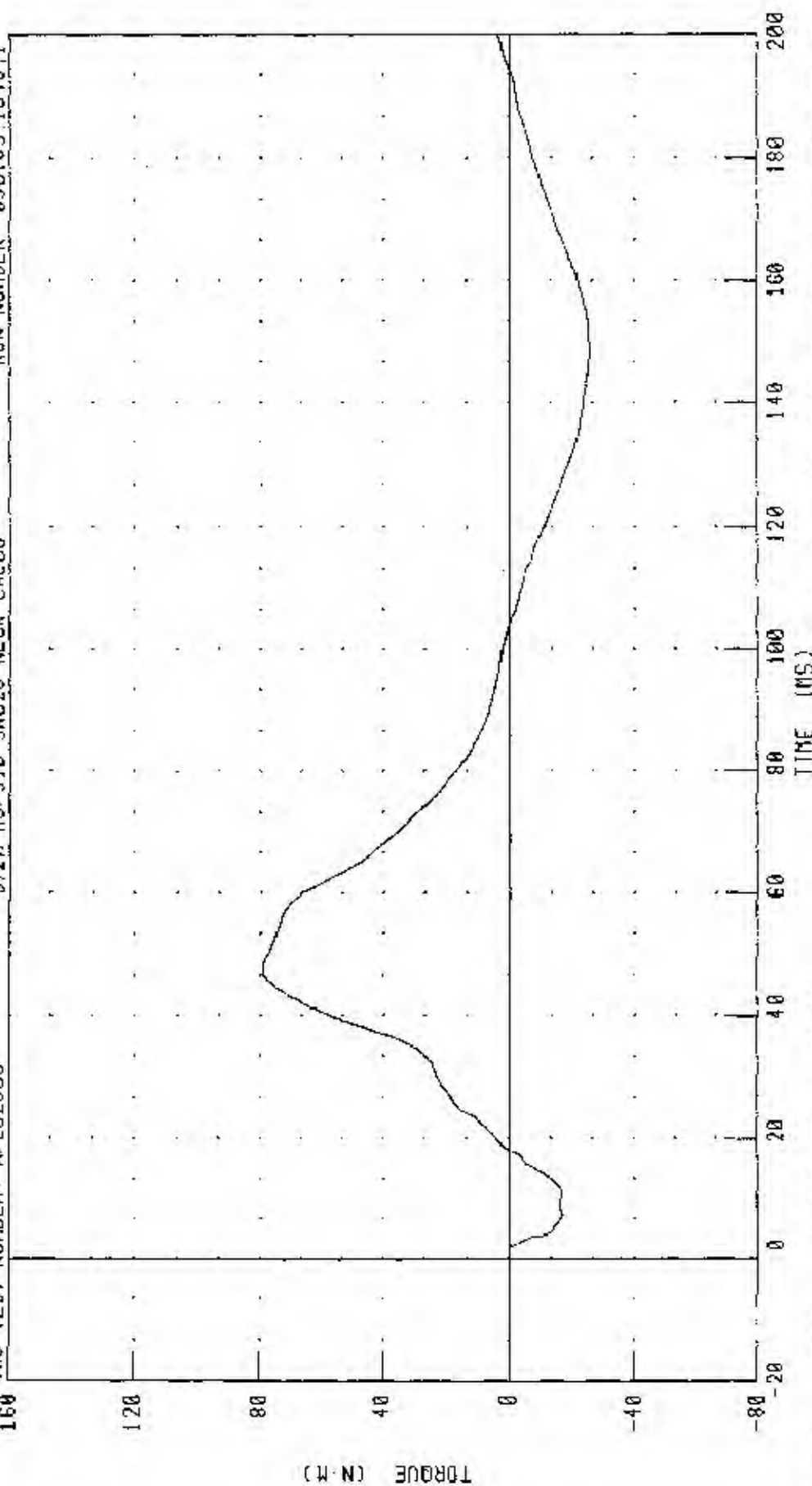
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

IRC TEST NUMBER: NFI02806

572M H3/SID SN028 NECK CAL06

RUN NUMBER: 050103 1846.1



CHANNEL: NEKOM FILTER: CH, CLASS 600

PEAK DATA: 79.19 N·m @ 47.68 ms; -25.44 N·m @ 149.52 ms

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

01-MAY-03

TRC INC.

572F SN028 DAMPER TEST CAL06

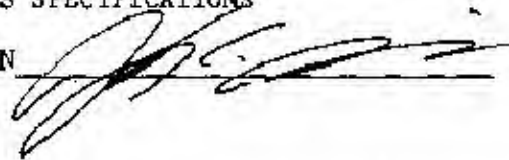
TEST NUMBERS: DP02806A, DP02806B, DP02806C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	43.0 %
VELOCITY	FORCE	667 - 925 N	821 N
2.71 M/S	DISPLACEMENT	29.7 - 34.5 MM	30.9 MM
VELOCITY	FORCE	1733 - 2100 N	1844 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	34.4 MM
VELOCITY	FORCE	3703 - 4402 N	3778 N
6.07 M/S	DISPLACEMENT	33.3 - 39.5 MM	36.6 MM

DAMPER SETTING = 5.5

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 050903.1436;1

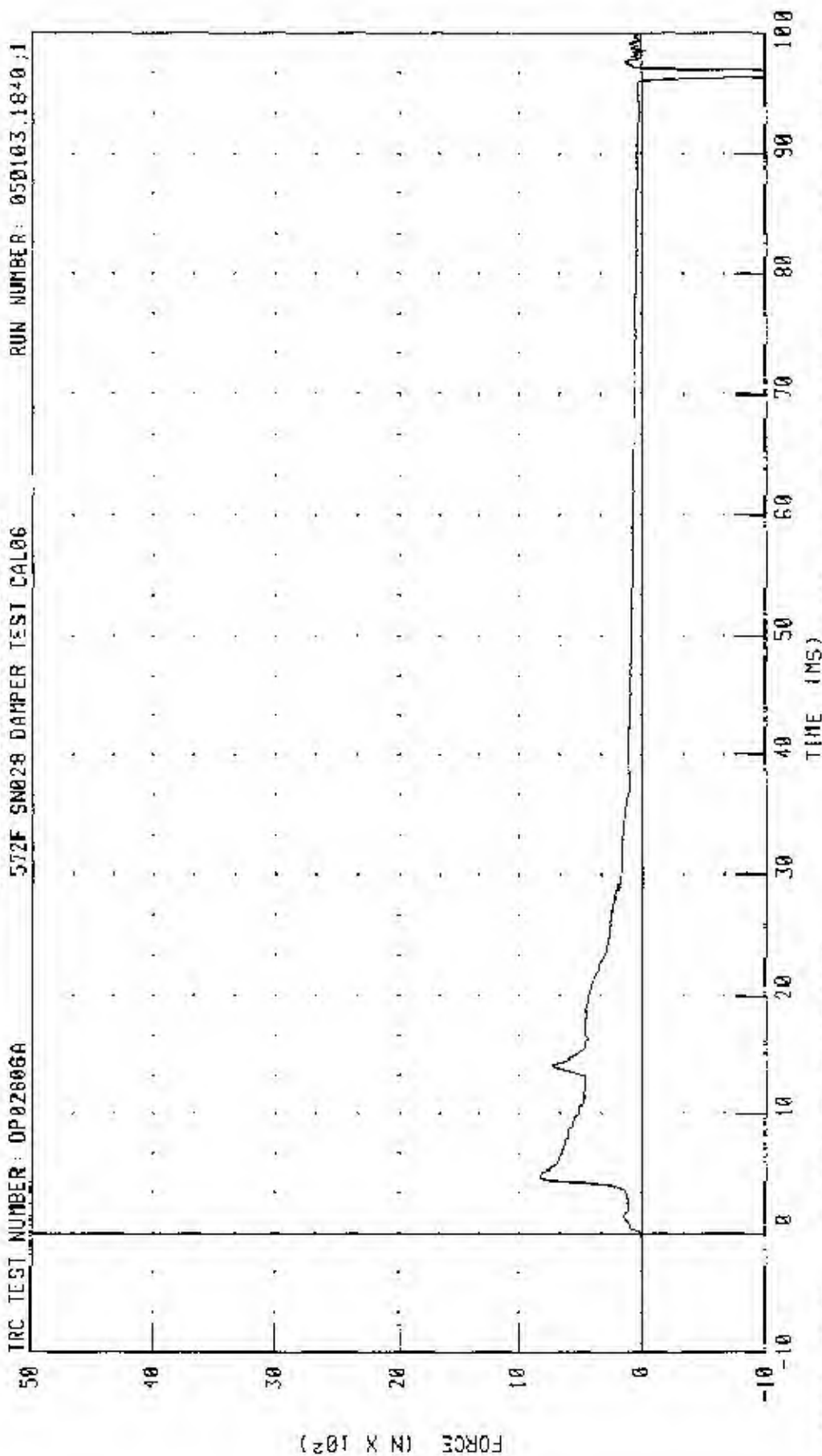
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 N/SEC)

SHOCK ABSORBER RESISTIVE FORCE

IRC TEST NUMBER: DP02806A

572F SN028 DAMPER TEST CAL06

RUN NUMBER: 050103.1840.1



CHANNEL: DAMPT FILTER: CH. CLASS 1000

PEAK DATA: 321.38 N @ 4.80 MS, -1415.84 N @ 96.48 MS

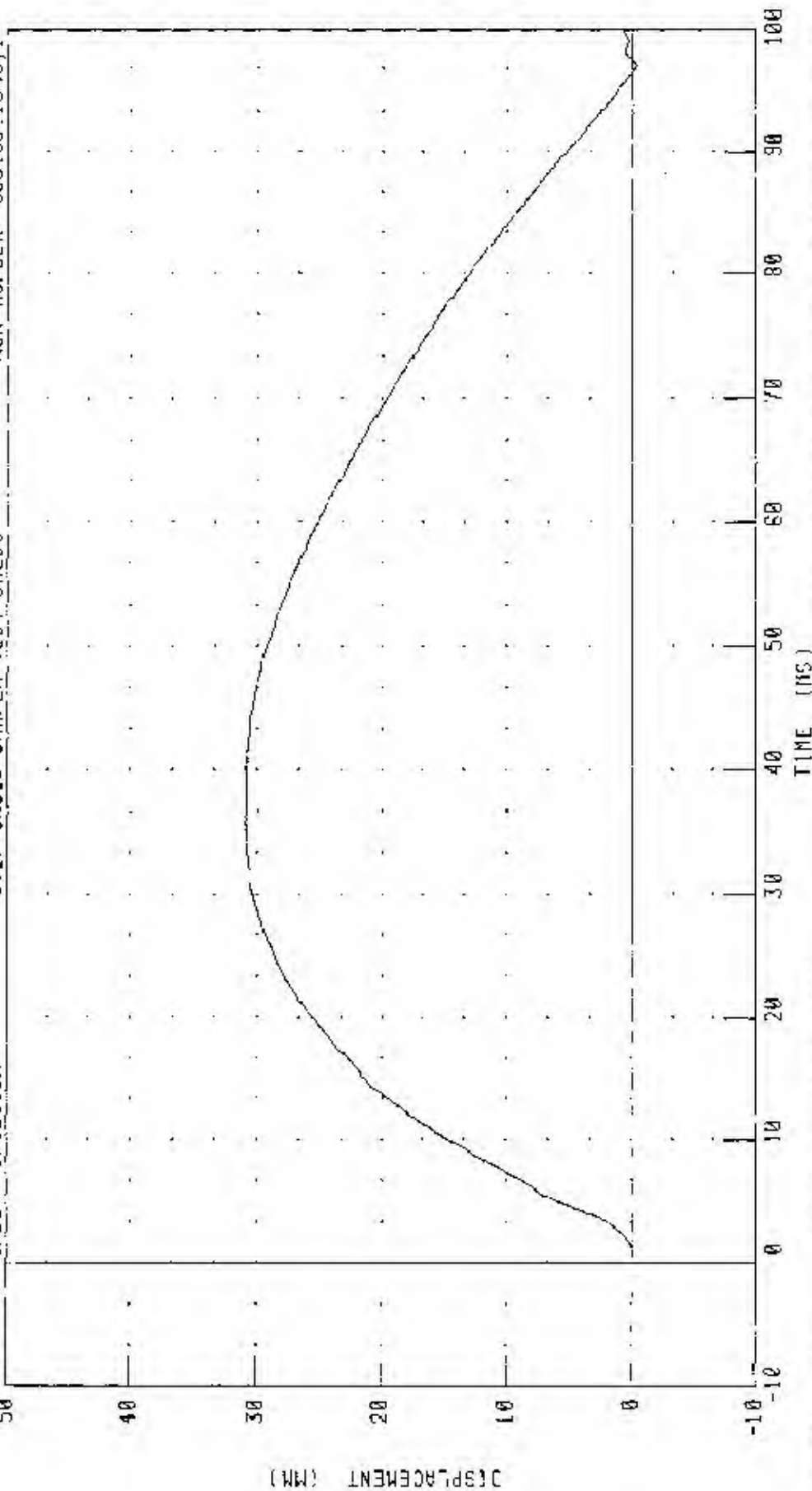
PART 572-F S.I.D THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F 5M02B DAMPER TEST CAL06

TRC TEST NUMBER: DP02B06A

RUN NUMBER: 050103.1840,1



PEAK DATA: 30.93 MM @ 35.04 MS, 0.34 MM @ 96.88 MS

CHANNEL: CSTVD FILTER: CH. CLASS 1000

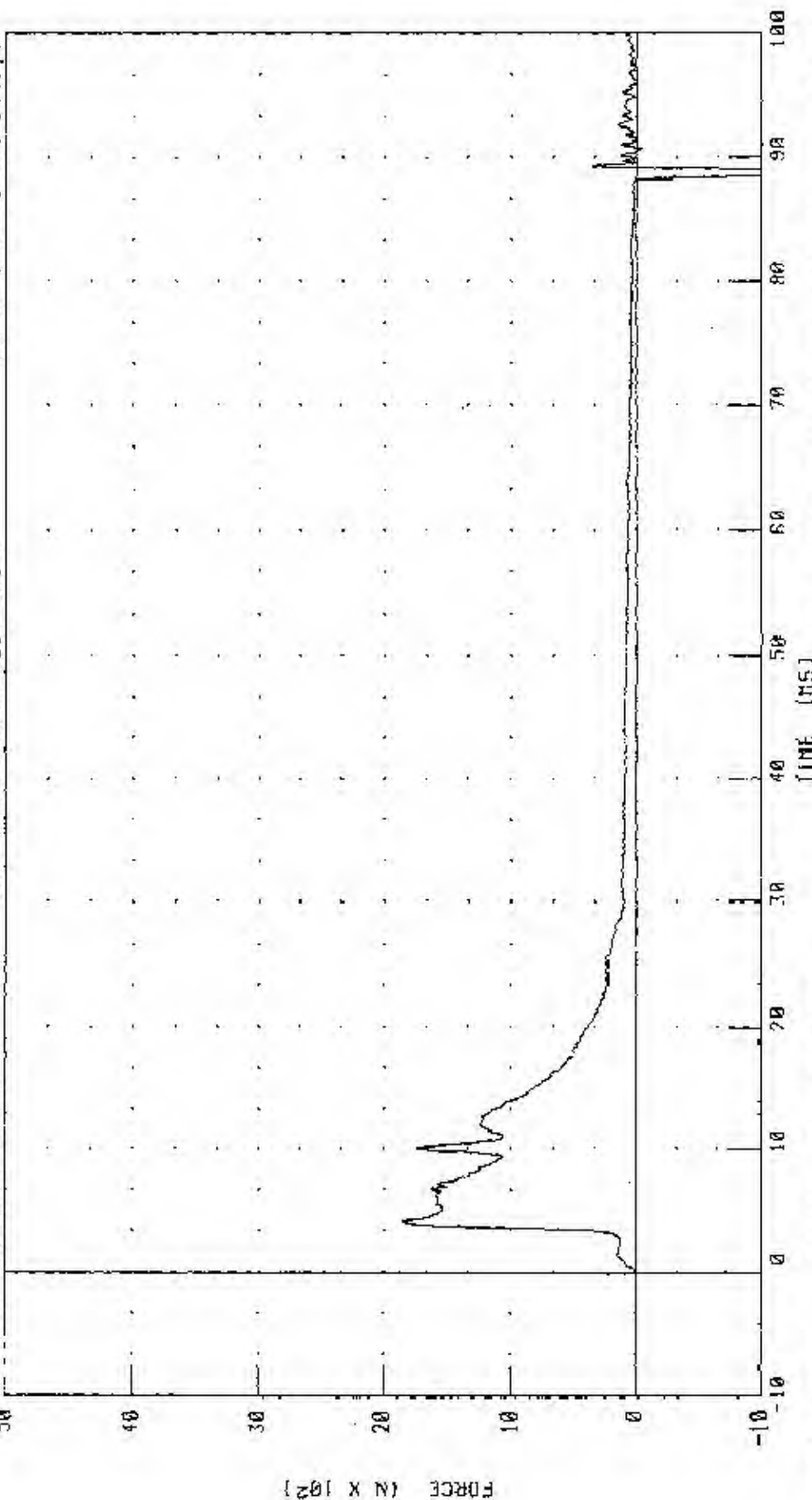
PART 572-F S I.D. HYDRAULIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN020 DAMPER TEST CAL08

TRC TEST NUMBER: 0P028068

RUN NUMBER: 050103.1041.1



CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA 1843.85 N 0 4.16 MS; -2435.87 N 0 88.80 MS

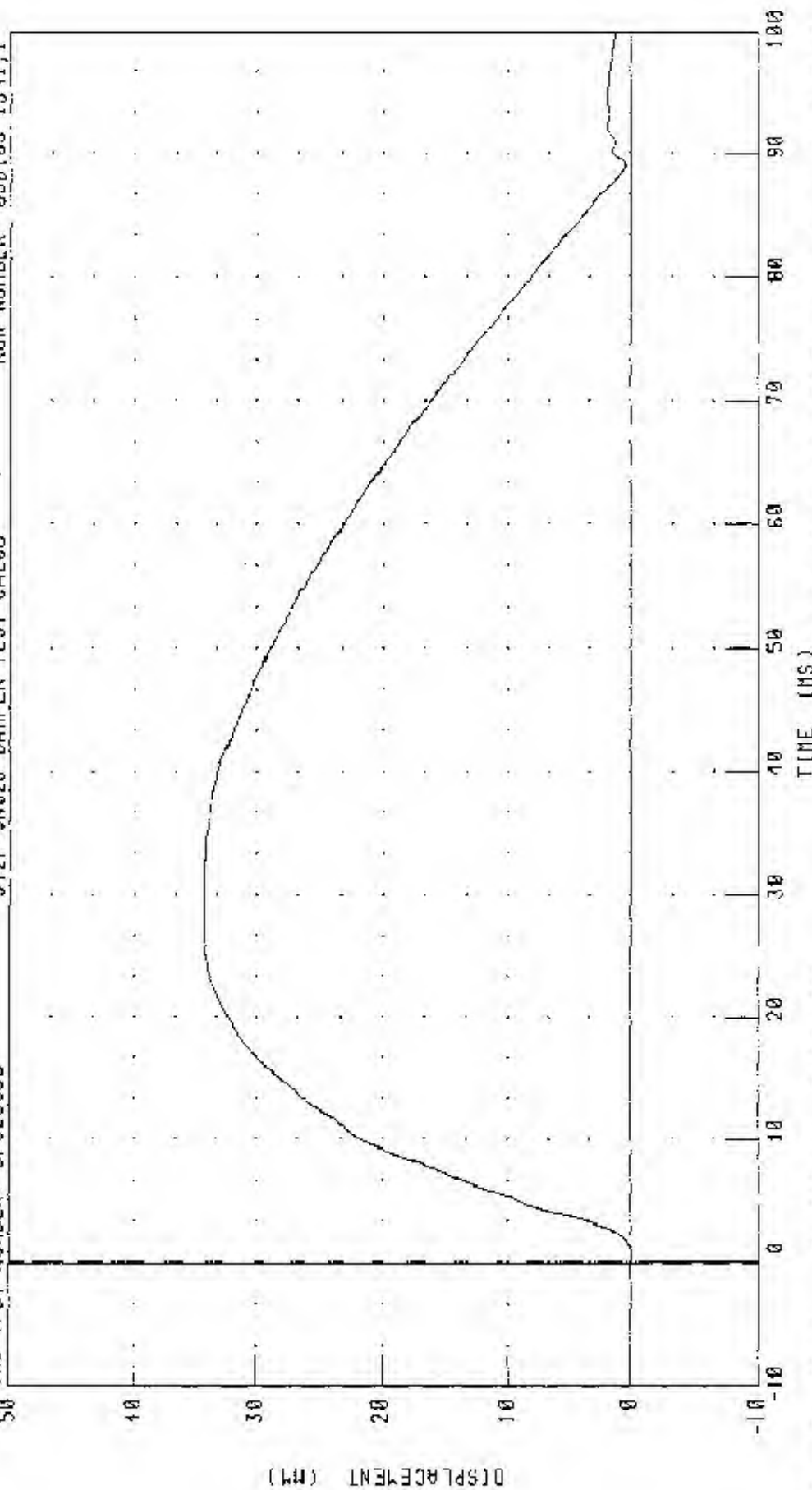
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (4.3 H/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP02B06B

572F SN028 DAMPER TEST CAL00

RUN NUMBER: 050103 1941,1



PEAK DATA: 34.38 MM @ 27.52 MS, -0.01 MM @ -7.76 MS

CHANNEL: CS100 FILTER: CH. CLASS 1000

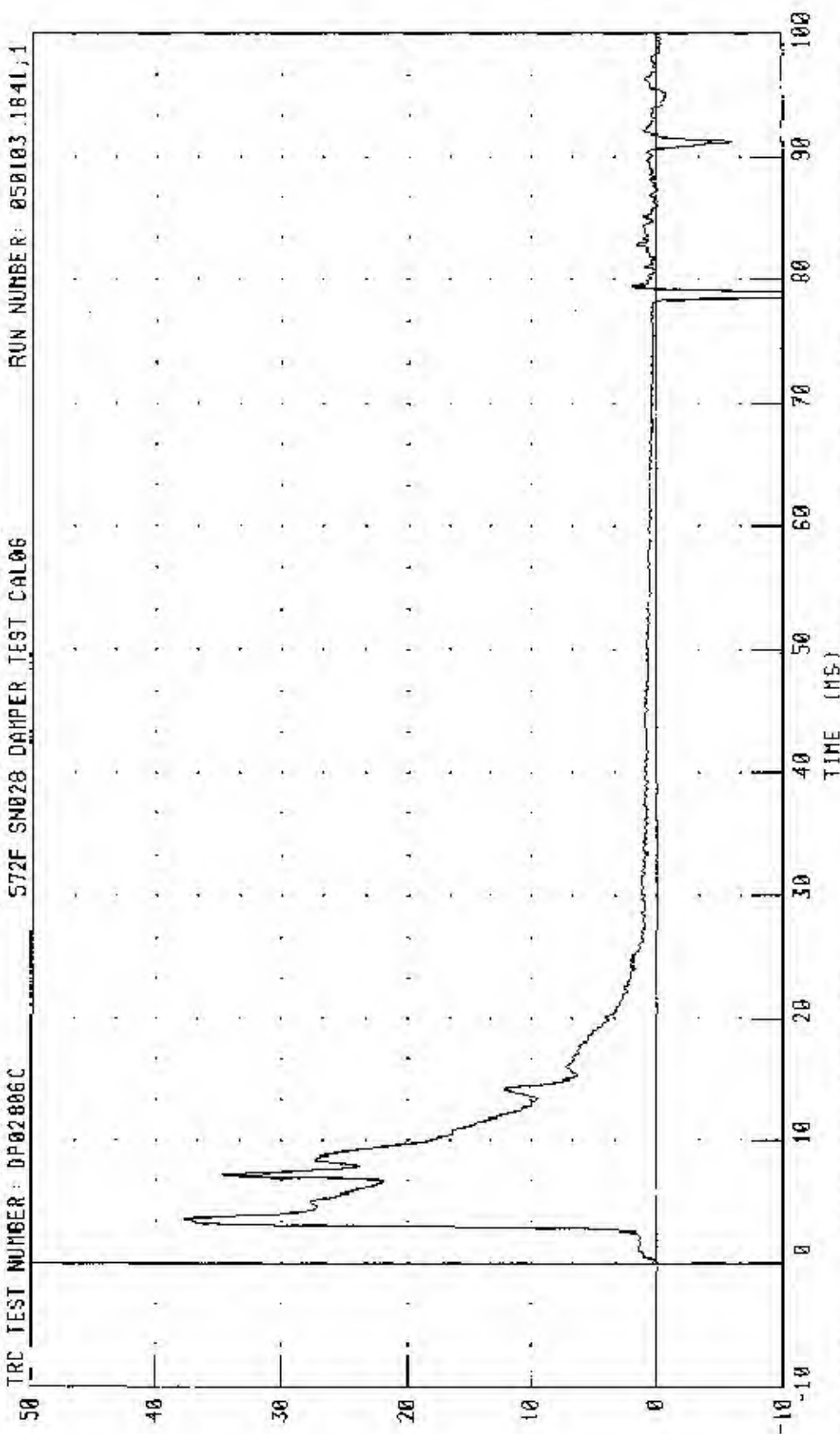
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

572F SN028 DAMPER TEST CAL06

TRC TEST NUMBER: DP02886C

RUN NUMBER: 050103.1841,1



PEAK DATA: 3777 88 N @ 3.52 MS; -2281 23 N @ 78.80 MS

CHANNEL: DAMPF FILTER: CH. CLASS 1000

FORCE (N X 10²)

030430

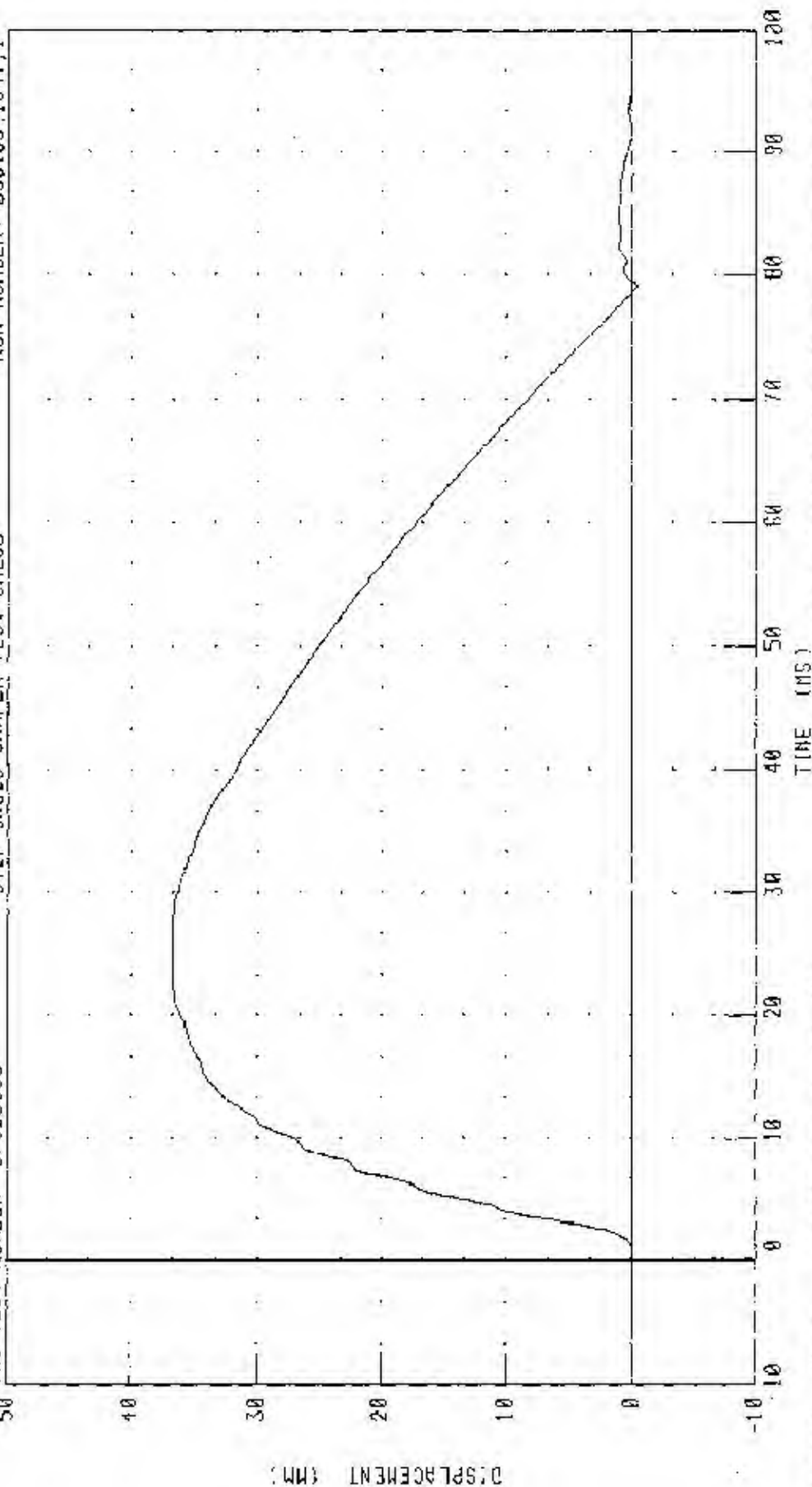
C-92

PART 572-F S.I.U THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN028 DAMPER TEST CAL06 RUN NUMBER: 050103.1841.1

IRC TEST NUMBER: DP02B06C



PEAK DATA: 36.64 MM @ 24.08 MS; -0.35 MM @ 79.12 MS

CHANNEL: CS1YD FILTER: CH. CLASS 1900

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

01-MAY-03

LEFT SIDE CONFIGURATION


TRC INC.

TEST NO: STL02806

572F SID SNO28 L.THORAX CAL06

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	43.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.29 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	40.0 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	42.6 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	17.5 G

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 050903.1441;1

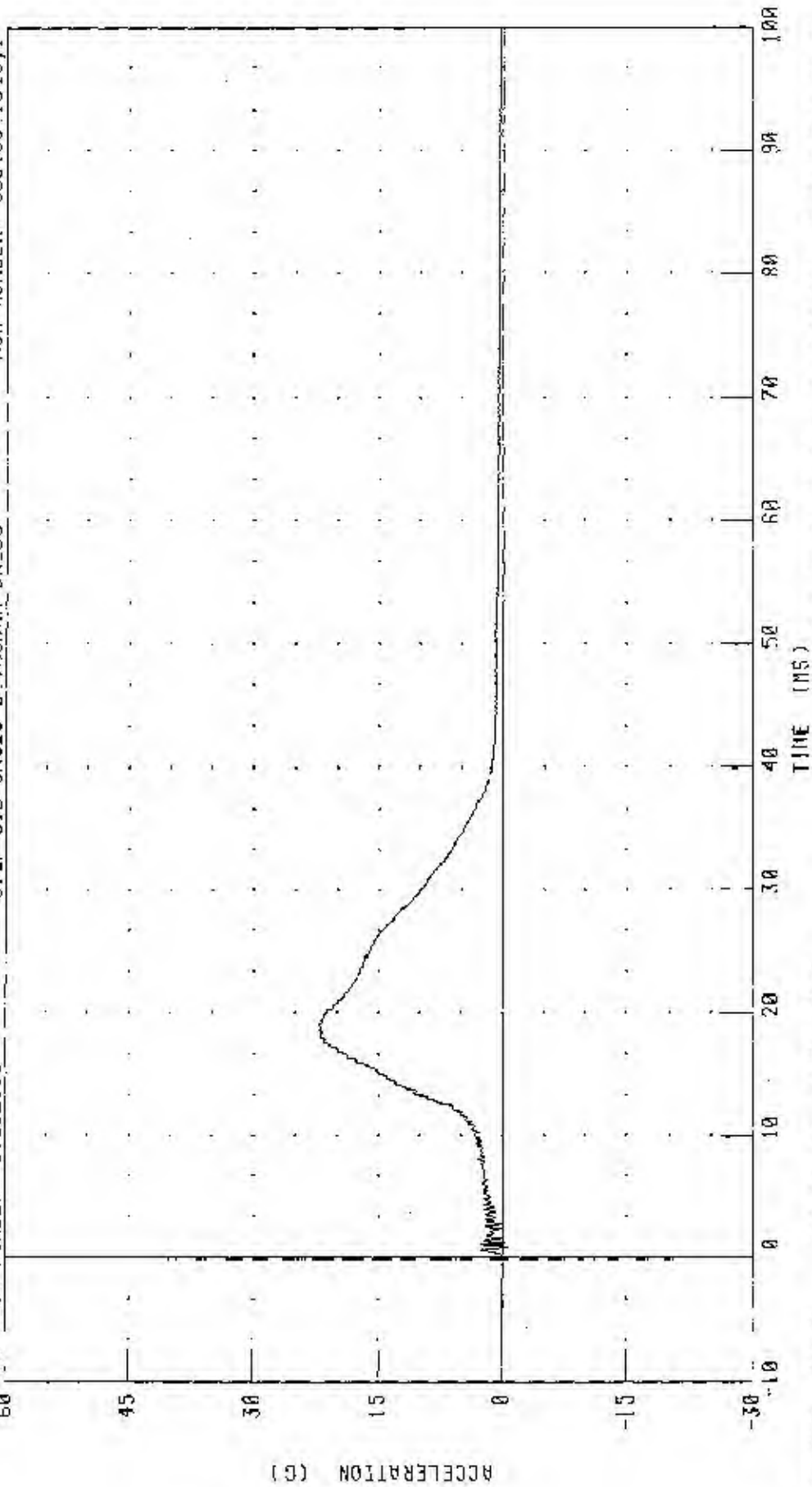
PART 572-F S I D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

RUN NUMBER: 050103.1316,1

572F SID SN028 L THORAX CAL06

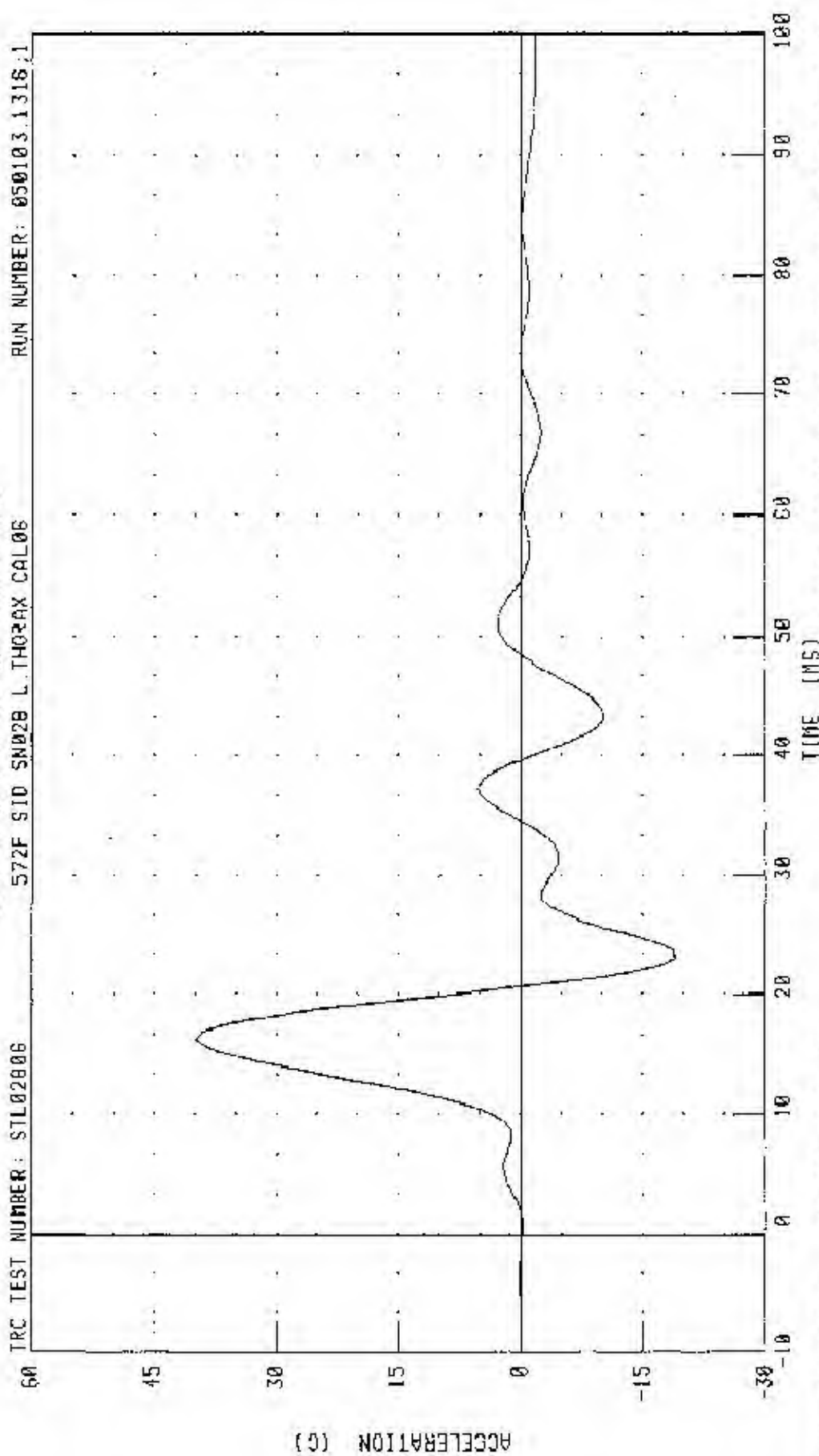
TRC TEST NUMBER: STL02806



PEAK DATA: 22 15 0 18.56 MS; -0.70 0 0 0 00 MS

CHANNEL: PENXC FTLIER CH CLASS 1000

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT UPPER RIB ACCELERATION Y AXIS



CHANNEL: LURYG FILTER: FJR 100

PEAK DATA: 39.99 G @ 16.25 MS; -19.01 G @ 23.13 MS

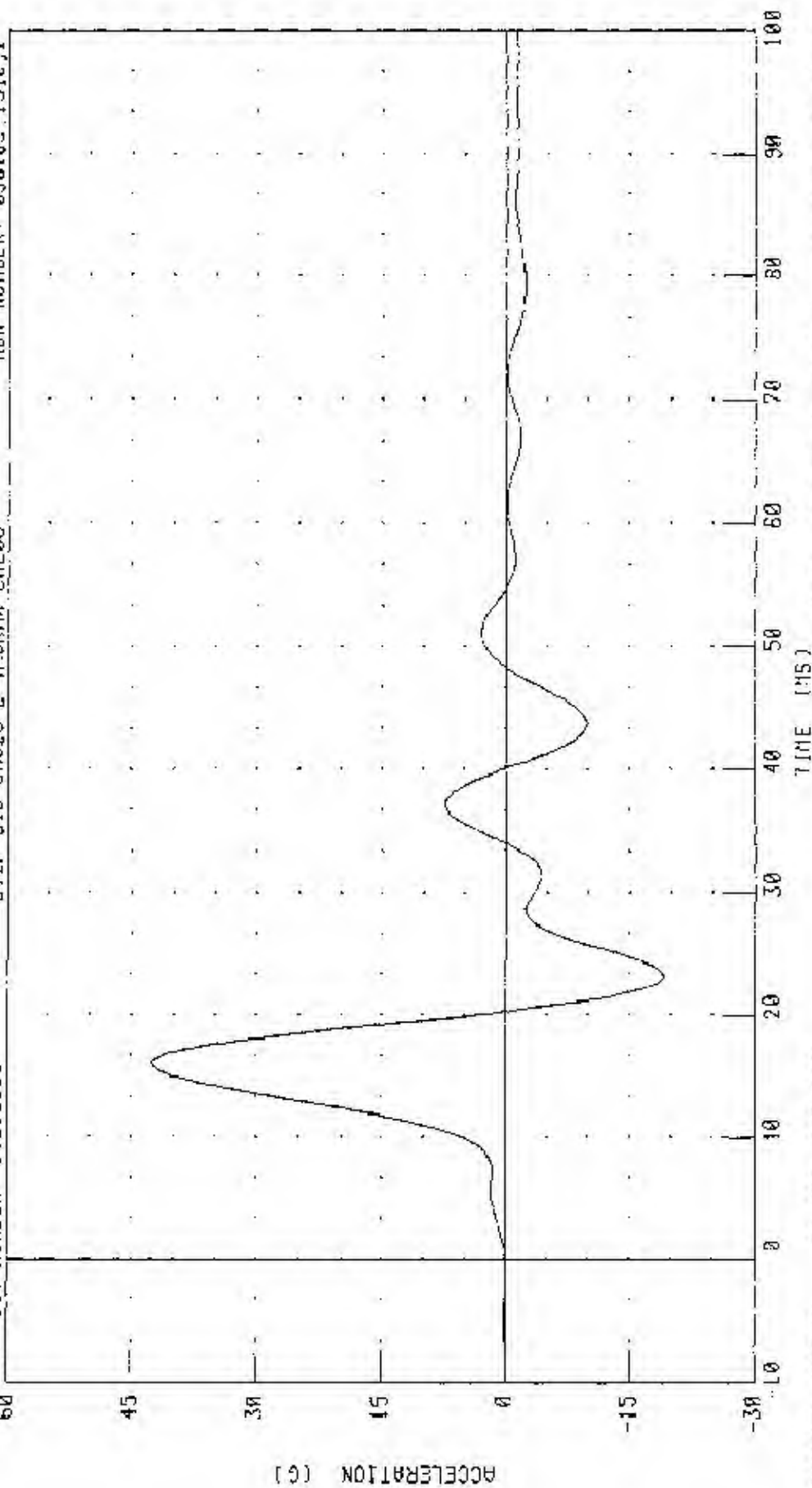
PART 572-F S I D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: 51402808

572F SID SN028 L THORAX CAL06

RUN NUMBER: 050103.1316.1



PEAK DATA: 42.64 G @ 16.25 MS; -19.26 G @ 23.13 MS

CHANNEL LURVC FILTER FIR 100

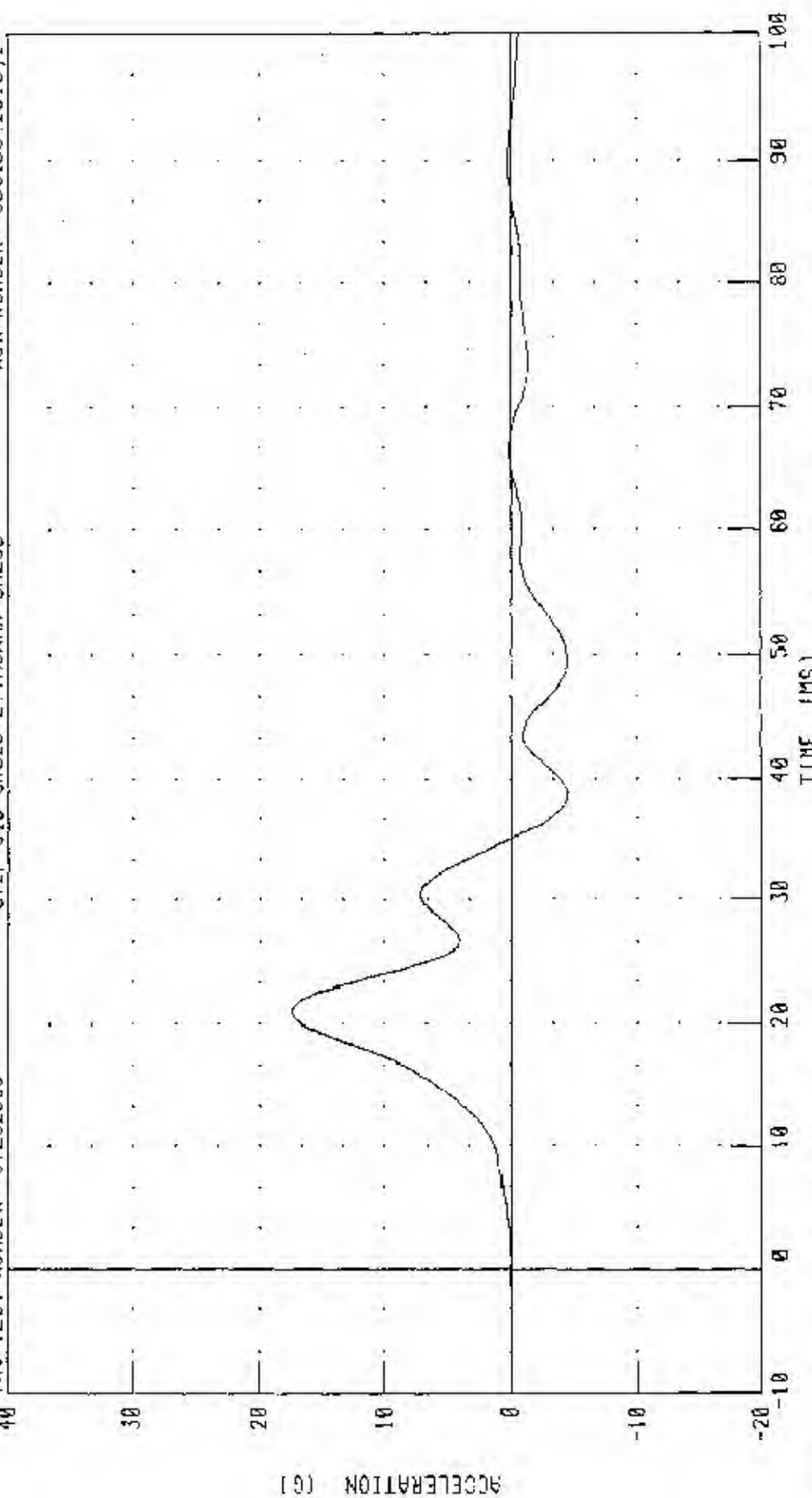
PART 572-F S I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: 57102886

572F S10 S0028 L THORAX CAL06

RUN NUMBER: 050103.1316.1



CHANNEL: 112Y5 FILTER: FIR 100

PEAK DATA: 17.49 G @ 21.25 MS, -4.55 G @ 49.37 MS

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 01-May-03

TRC, INC.

TEST NO: 028C06LF1

572B SN 028 TORSO FLEX CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 - 70 %	43 %
FORCE AT 0 DEG. FLEXION	-27 - 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 - 151 N	129.0 N
FORCE AT 30 DEG OF FLEXION	151 - 205 N	191.3 N
FORCE AT 40 DEG OF FLEXION	205 - 258 N	218.0 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	8 "

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572B Abdomen Compression Test

HIH SID Serial No. 028 Calibration No. 06 - 1

Test Date 05/01/2003

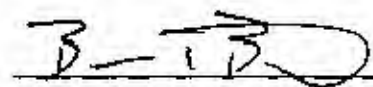
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.3 - 8.1 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



05.02.2003 11:02:52 5



C-100

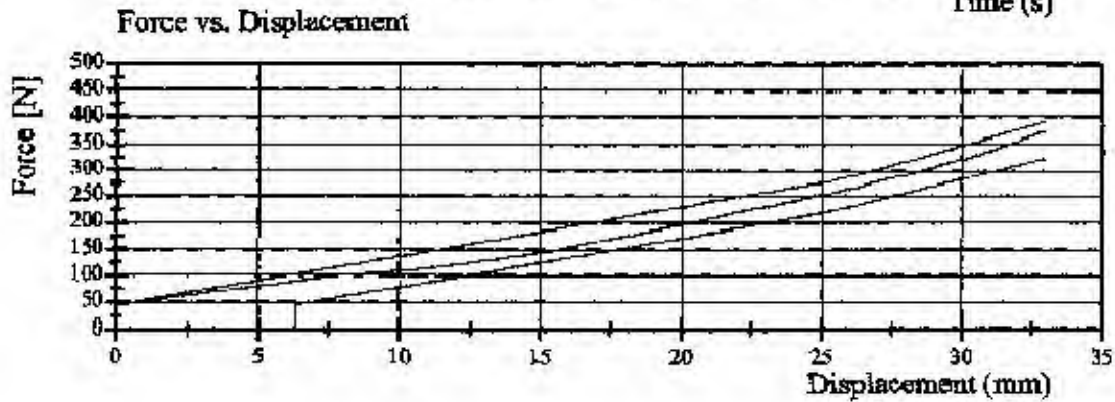
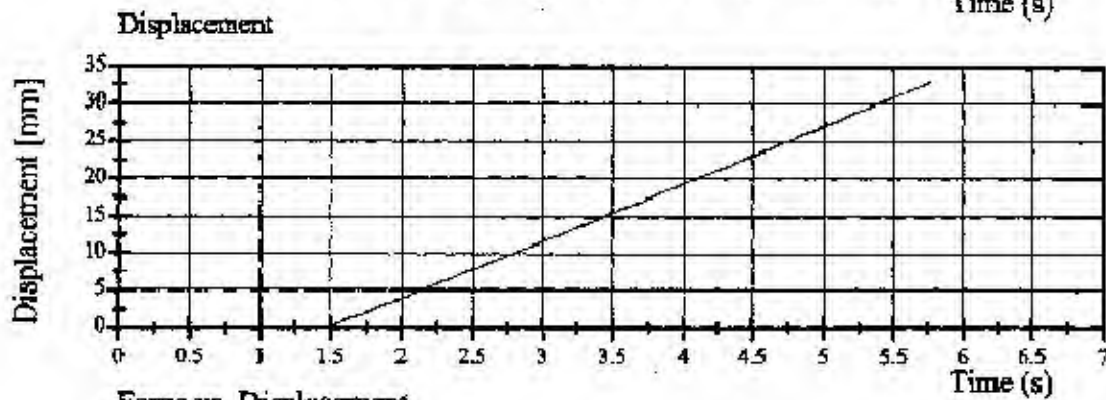
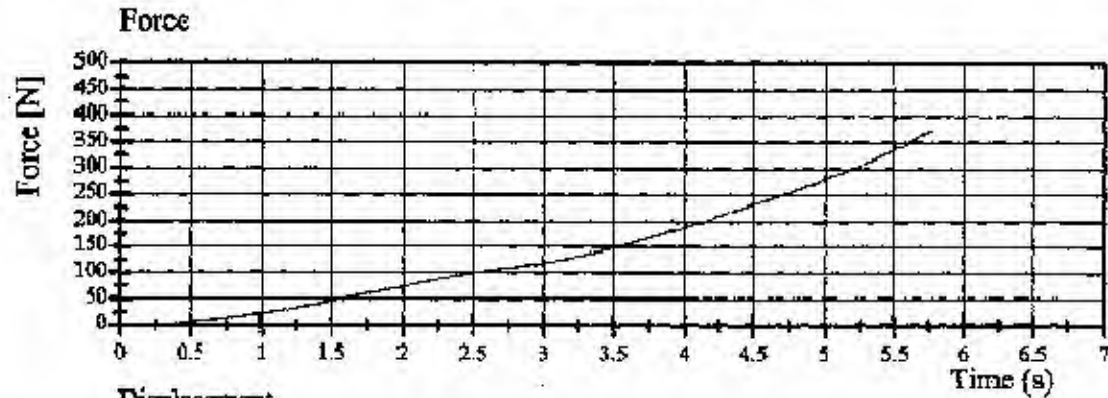
030430

Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 028 Calibration No. 06 - 1

Test Date 05/01/2003



05.02.2003 11:02:38 5



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUNNY

01-MAY-03

LEFT SIDE CONFIGURATION

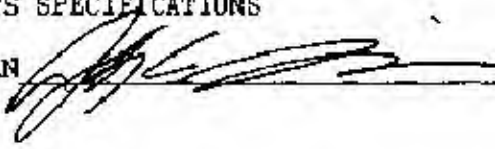
TRC INC.

TEST NO: SPL02806

572F SNO28 LEFT PELVIS CAL06

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	43.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.29 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	47.6 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.3 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 050903.1439;1

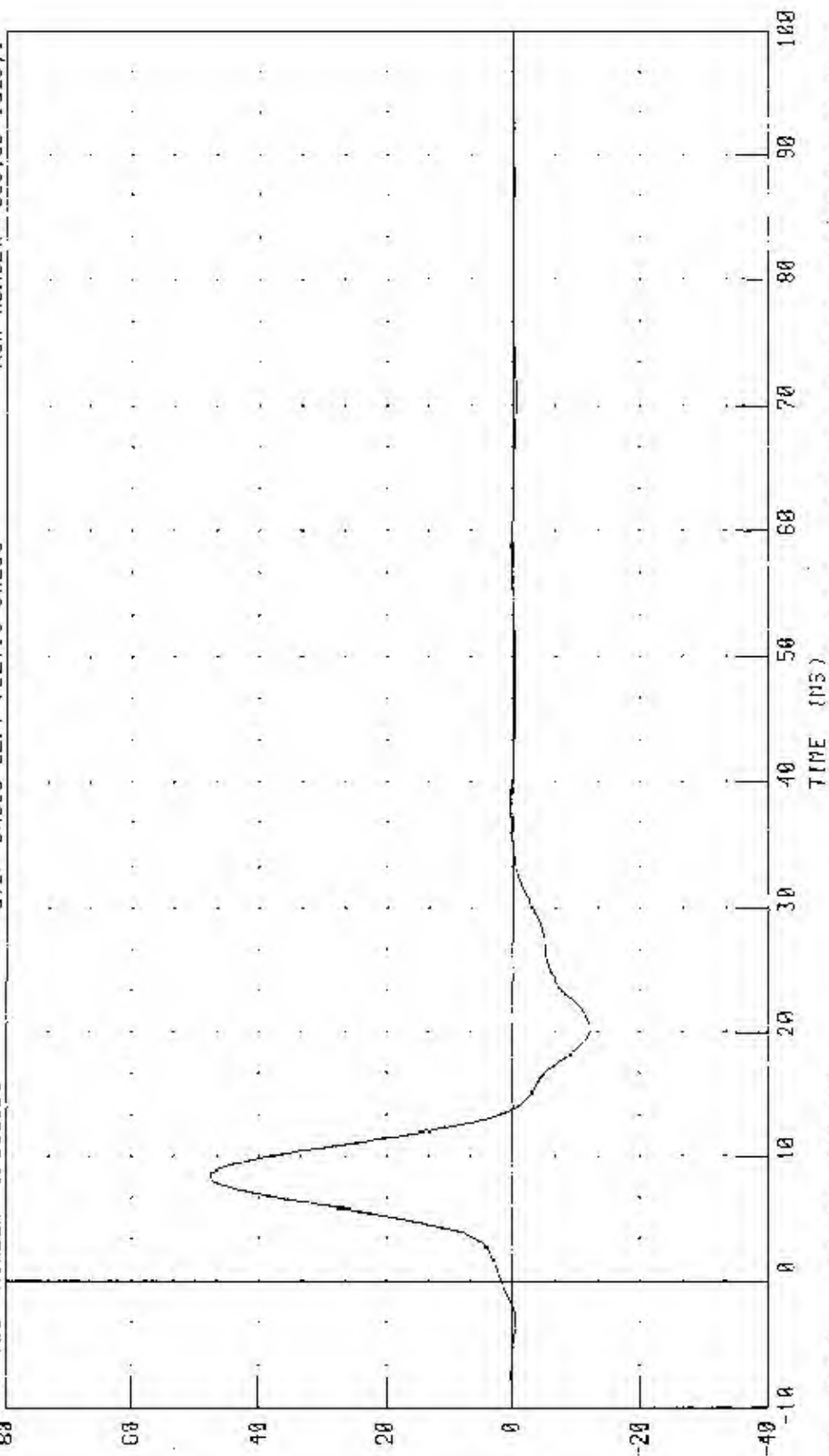
PART 572 F S I D PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PF: VIS ACCELERATION Y AXIS

572F SN028 LEFT PELVIS CAL06

INC TEST NUMBER: SPL02806

RUN NUMBER: 050103 1320.1



PEAK DATA 47.56 G @ 0.75 MS: -12.07 G @ 20.00 MS

CHANNEL PEVYC FILIFR F1R 100

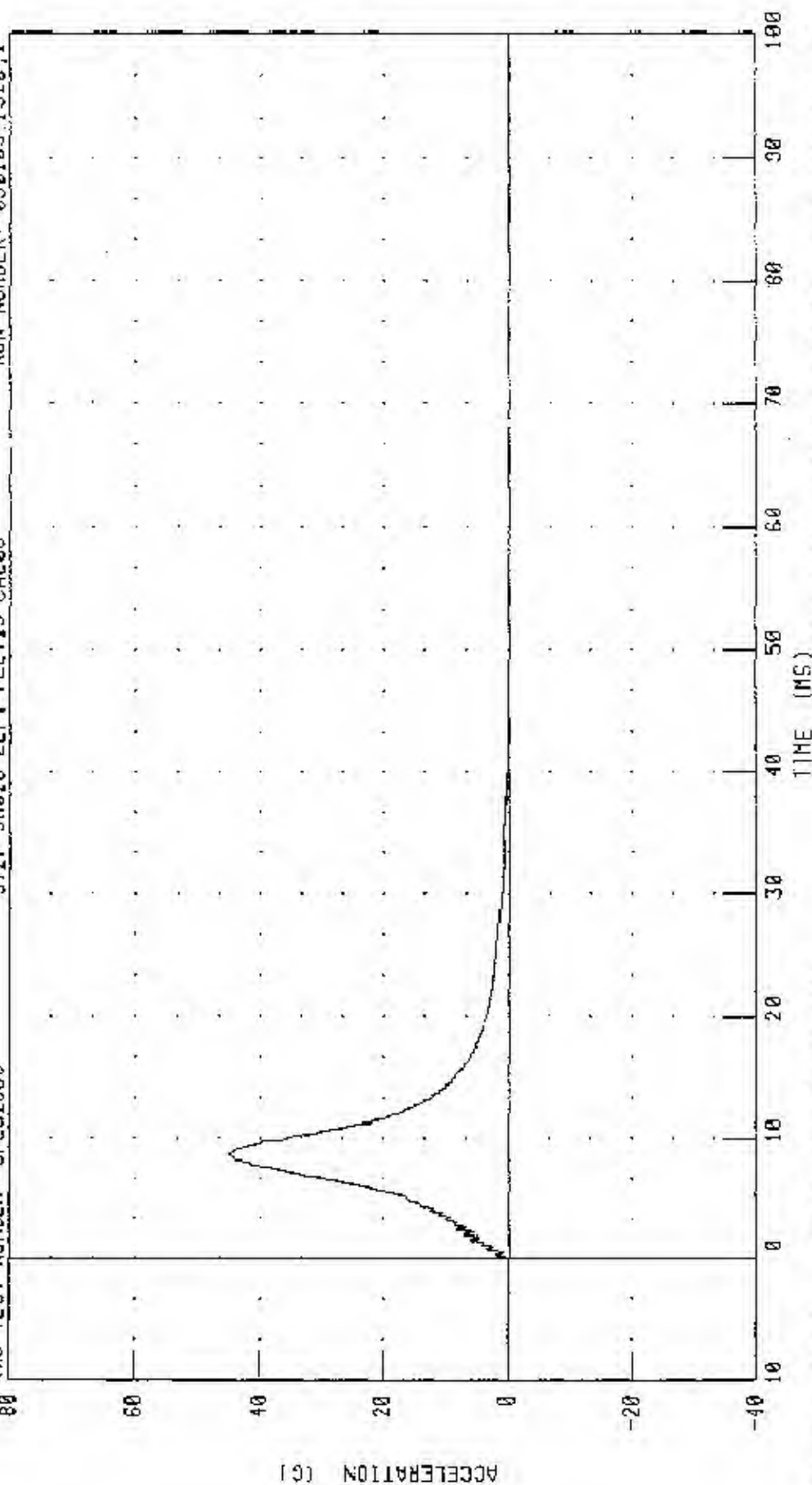
ACCELERATION (G)

PART 572-F 5.1.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)
 PENDULUM DECELERATION

TRC TEST NUMBER: SPL02806

572F SN028 LEFT PELVIS CAL06

RUN NUMBER: 0501031320.1



CHANNEL: PENXG FILTER: CH CLASS 1000

PEAK DATA: 44.95 G @ 8.72 MS; -0.12 G @ 49.12 MS

Calibration Test Results

Post-Test

SID: 065

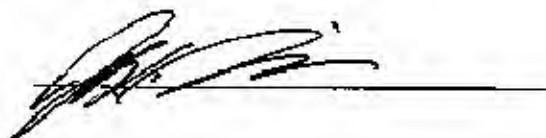
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was not tested at this time.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.
572M SID/HIII Dummy
External Dimensions
Serial No. 065 Calibration No. 10

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	897 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	511 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	238 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	512 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	499 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	371 mm	Yes
Top Rib Width From CVL	RW-1	165.1 - 180.3 mm	171 mm	Yes
Bottom Rib Width From CVL	RW-2	165.1 - 180.3 mm	171 mm	Yes
Difference Between Top & Bottom Rib Width from CVL		<= 2.5 mm	0.0 mm	Yes

Technician



Approved




TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

SID/HIII DUMMY

01-JUN-03

LEFT SIDE CONFIGURATION

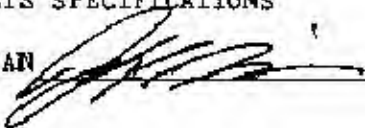
TRC INC.

TEST NO. HDL06510

572M SID/HIII SN065 HEAD CAL10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	43.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	135.35 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-11.78 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 050103.1325;1

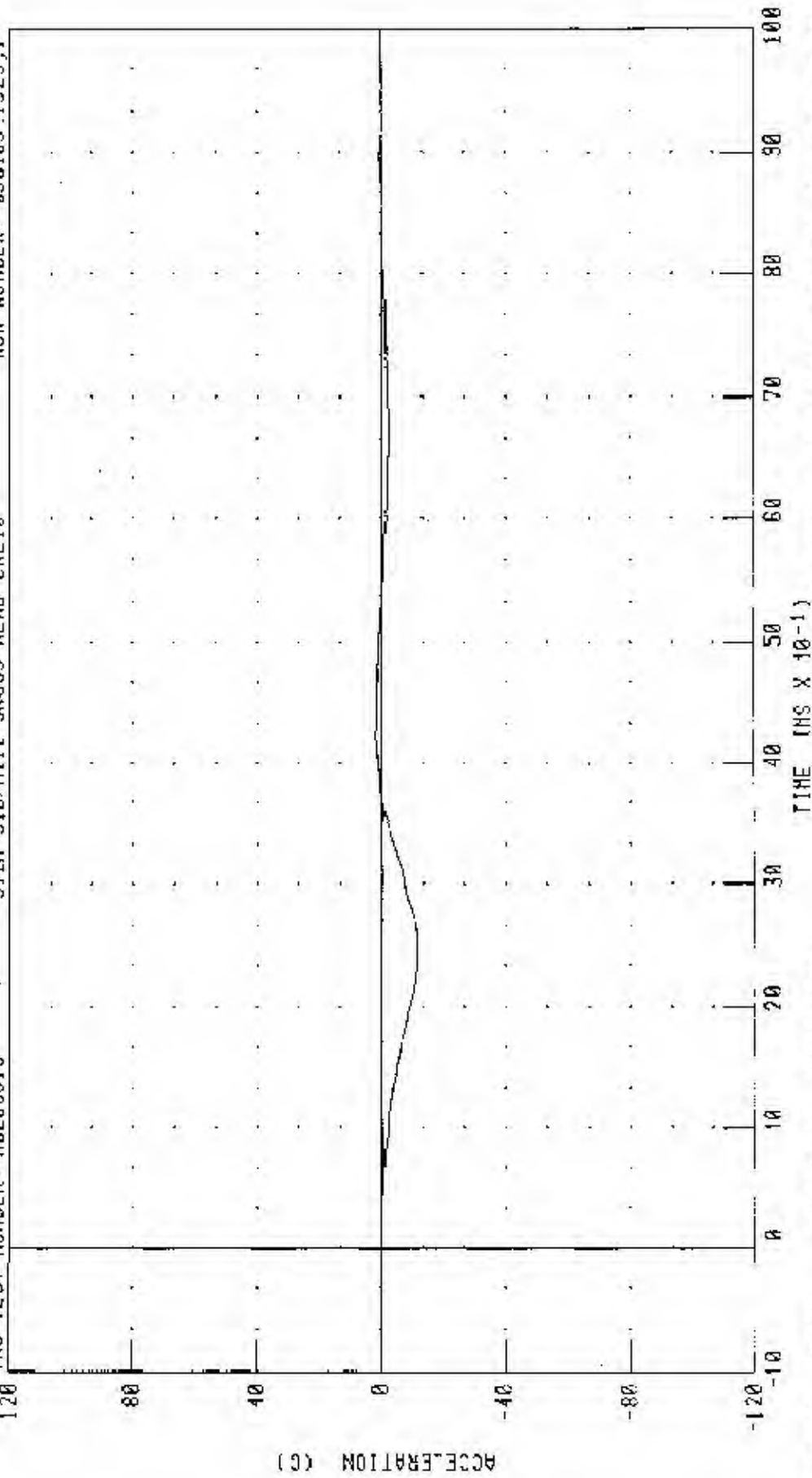
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL08510

572M SID/HIII SN065 HEAD CAL10

RUN NUMBER: 050103.1325.1



TIME (MS X 10⁻¹)

CHANNEL: HEDXC FILTER: CH CLASS 1000

PEAK DATA: 1.72 G @ 4.24 MS; -11.78 G @ 2.48 MS

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

RUN NUMBER: 050103.1325.1

572M SID/HIII 50055 HEAD CAL10

TRC TEST NUMBER: H0106510

200

160

120

80

40

0

-10

ACCELERATION (G)

TIME (MS X 10⁻¹)

100

90

80

70

60

50

40

30

20

10

0

CHANNEL: HEDYC

FILTER: CH. CLASS 1000

PEAK DATA

66.45 G @ 2.56 MS, -2.32 G @ 5.04 MS

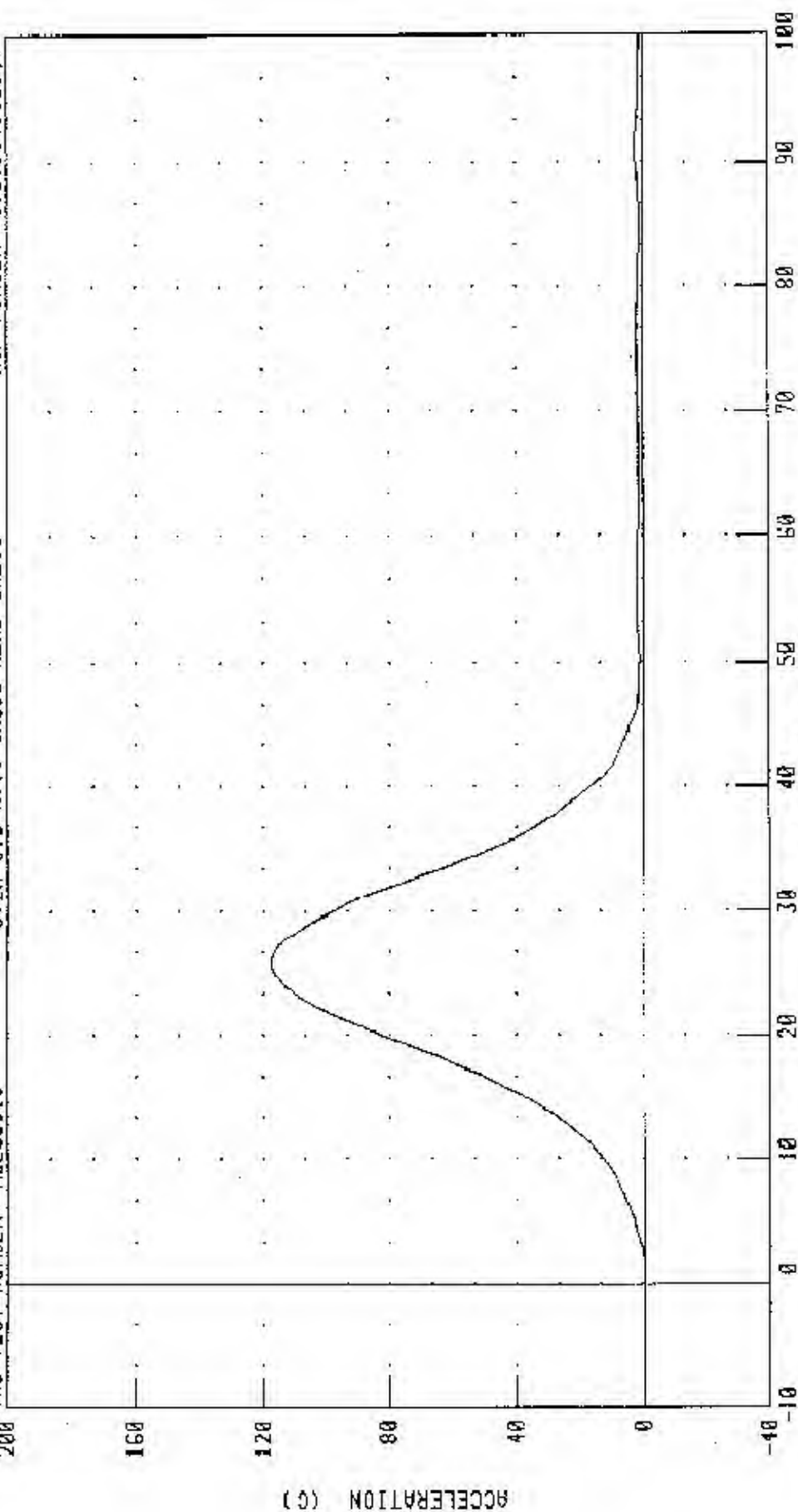
572M SID/HIT DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HDL06510

572M SID/HIT SN065 HEAD CAL10

RUN NUMBER: 050103.1325.1



TIME (MS X 10⁻¹)

CHANNEL: HDZC FILTER: CH. CLASS 1000

PEAK DATA: 117.35 G 2.56 MS, -0.12 G @ -0.24 MS

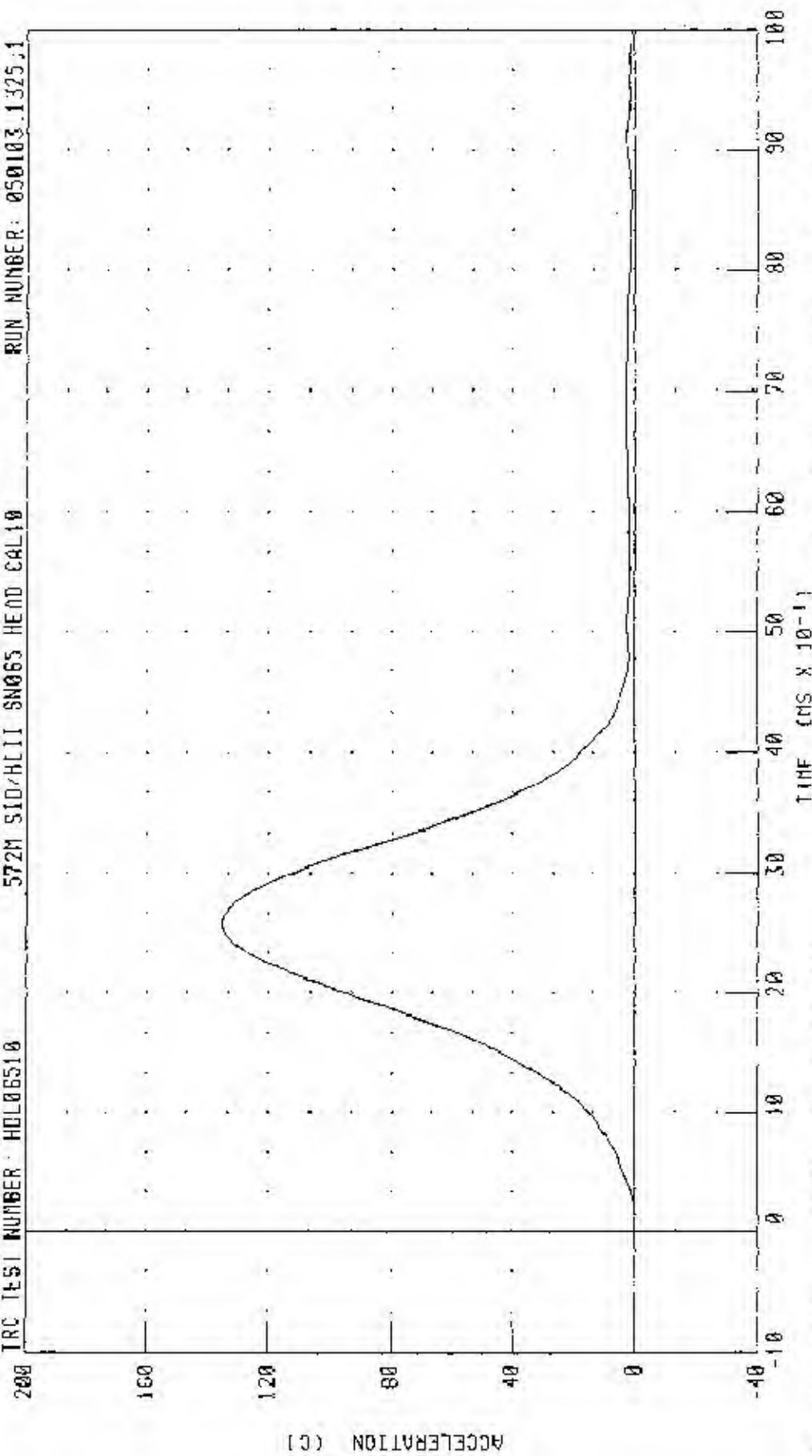
572N SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

572M SID/HILL SN065 HEAD CAL10

TRC TEST NUMBER: H0106510

RUN NUMBER: 050103.1325.1



PEAK DATA: 135.35 G @ 2.56 MS; 0.00 G @ -0.00 MS

CHANNEL: HF00C FILTER: CH CLASS 1000

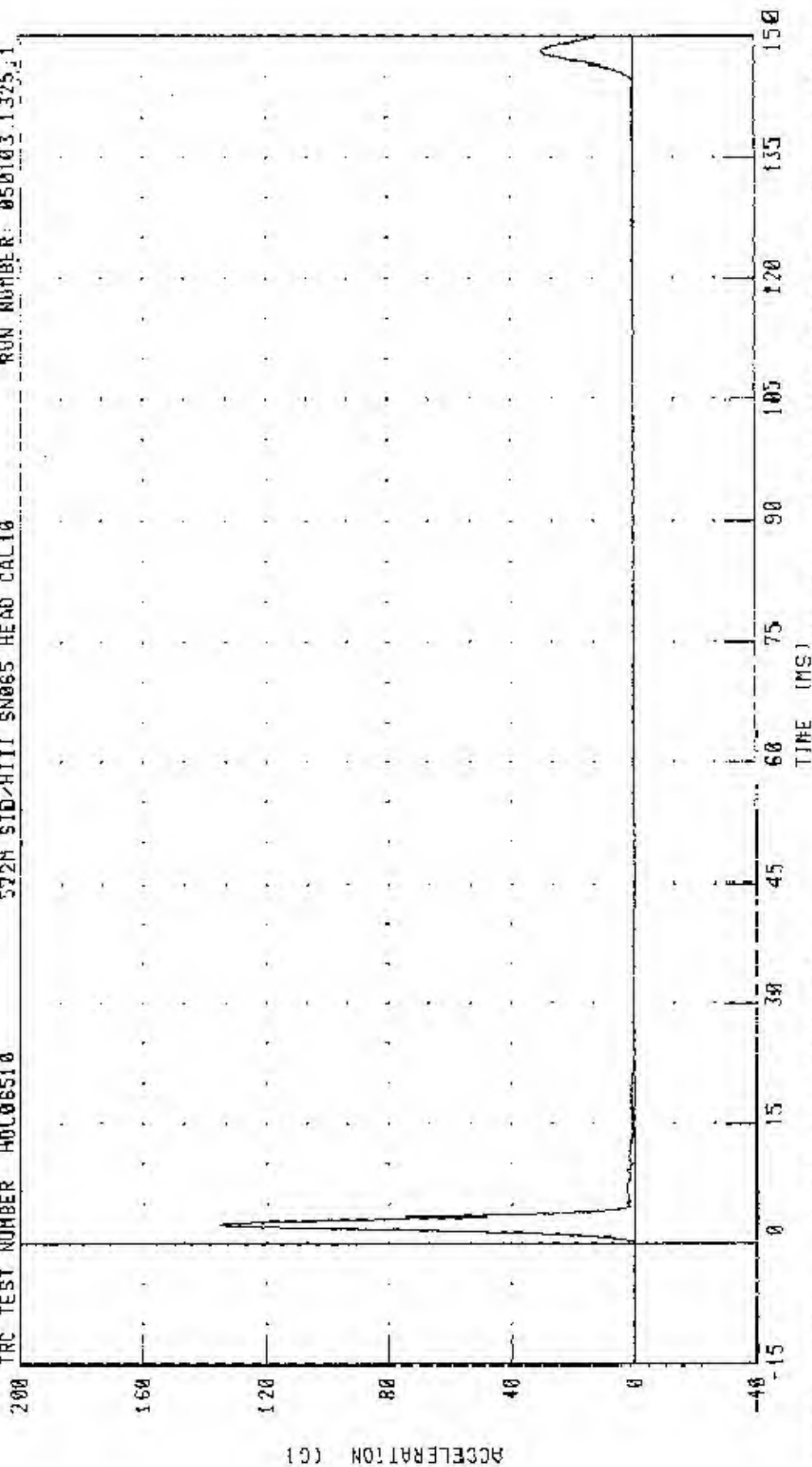
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

CHECK PLOT - HEAD RESULTANT ACCELERATION

RUN NUMBER: 050103.1325.1

572M SID/HIII SN065 HEAD CAL10

TRC TEST NUMBER HDL06510



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 135.35 G @ 2.56 MS, 0.00 G @ -13.84 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

SID/HIII DUMMY

01-JUN-03

LEFT SIDE CONFIGURATION

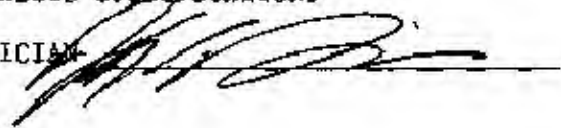
TRC INC.

TEST NO. NFO06510

572H H3/SID SN065 NECK CAL10

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY		10 - 70 %	43.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.38 M/S
	20 MS	4.12 - 5.10 M/S	4.81 M/S
	30 MS	5.73 - 7.01 M/S	6.71 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.12- 7.21 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	71.85 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	61.76 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	80.99 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	51.60 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	7.04 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 050103.1734;1

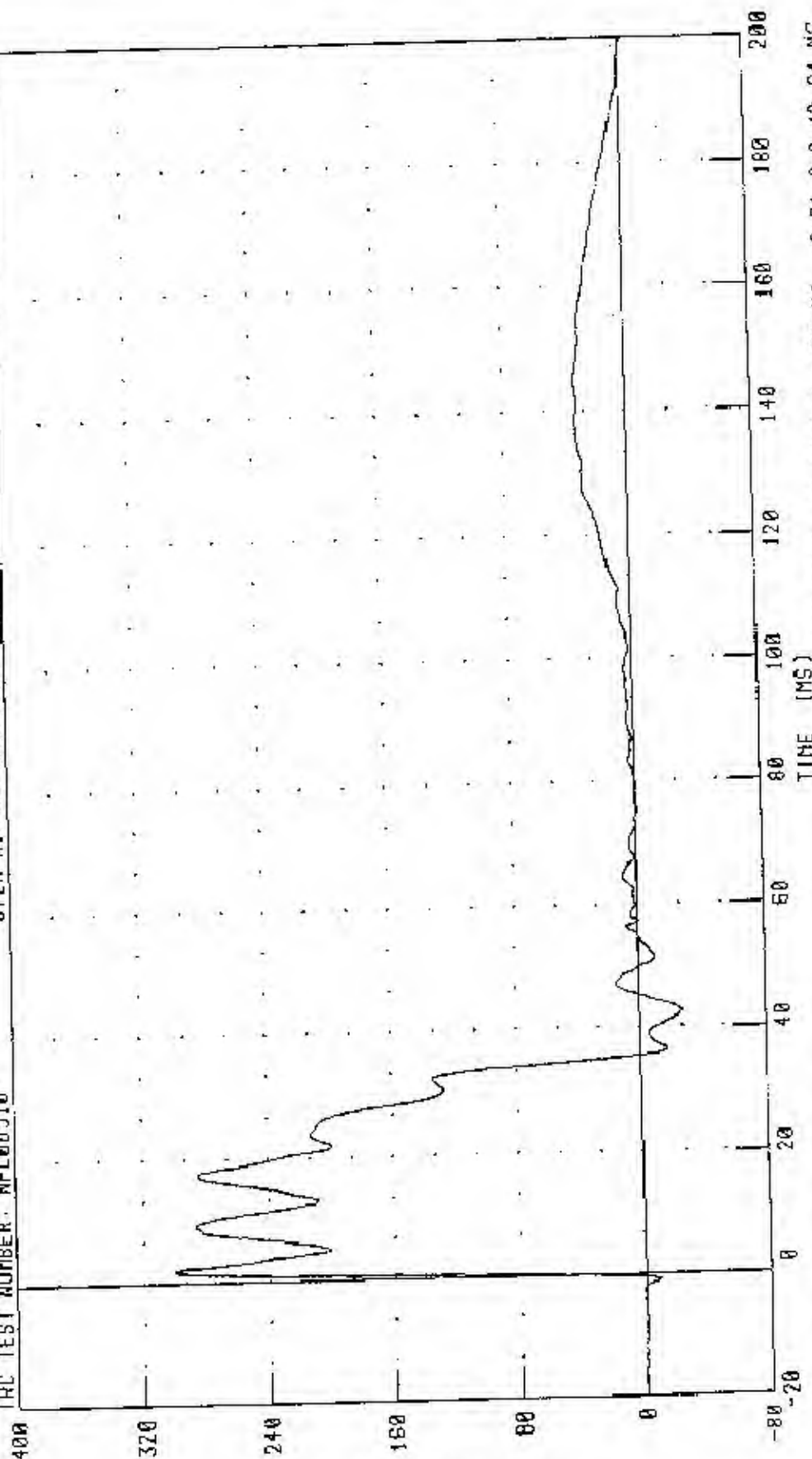
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

RUN NUMBER: 050103.1735;1

572M H3/SID SN085 NECK CAL10

TRC TEST NUMBER: NFI08510



PEAK DATA: 38.12 G @ 1.76 MS; -2.71 G @ 42.64 MS

CHANNEL: PENXG FILTER: CH CLASS 180

ACCELERATION (G X 10⁻¹)

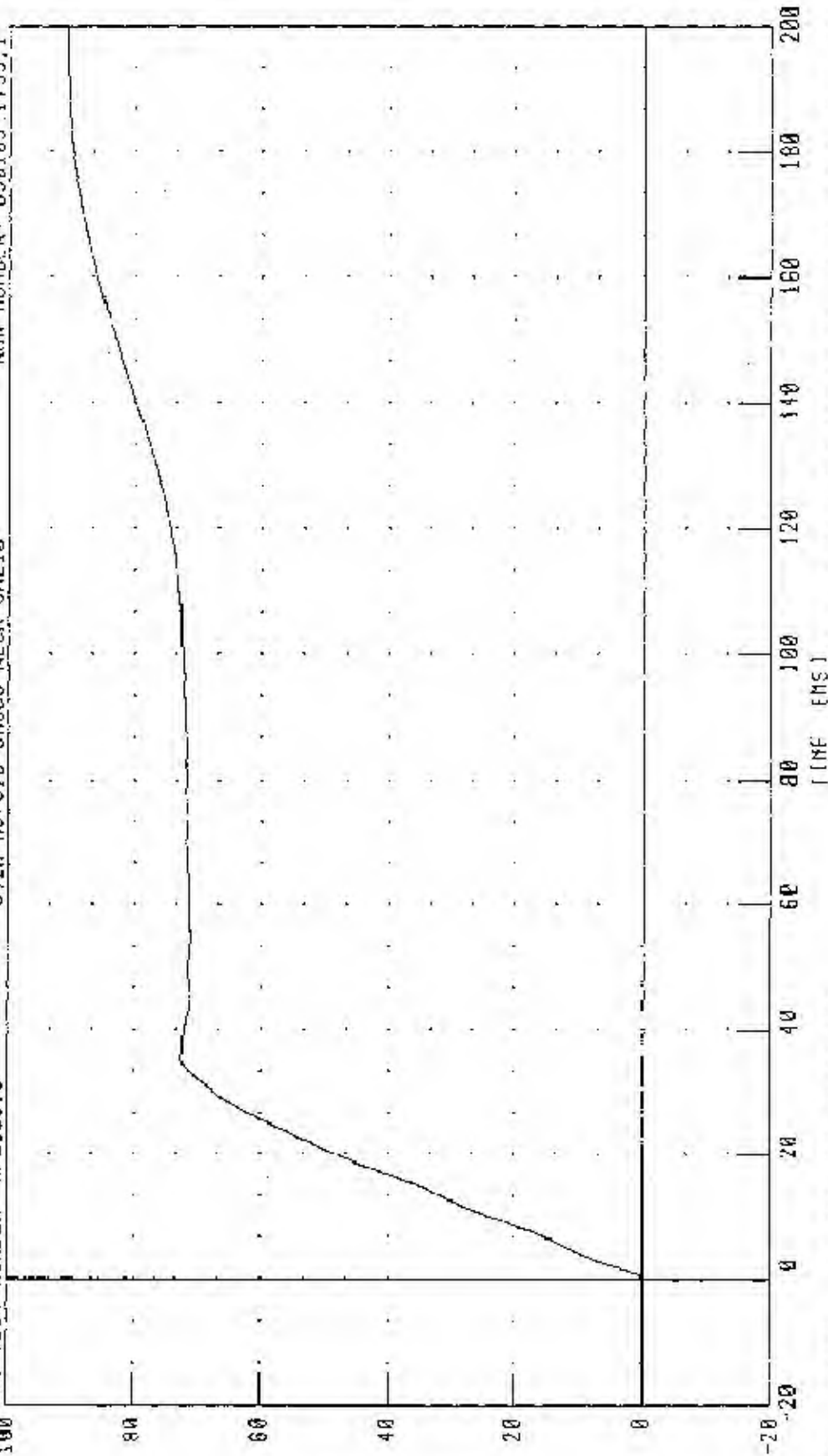
572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER: NFLO6510

572M H3/S10 SN065 NECK CAL10

RUN NUMBER: 050103.1735.1



CHANNEL PENXV1 FILTER CH. CLASS 180

PEAK DATA: 9.08 M/S @ 197.68 MS; -0.01 M/S @ -0.48 MS

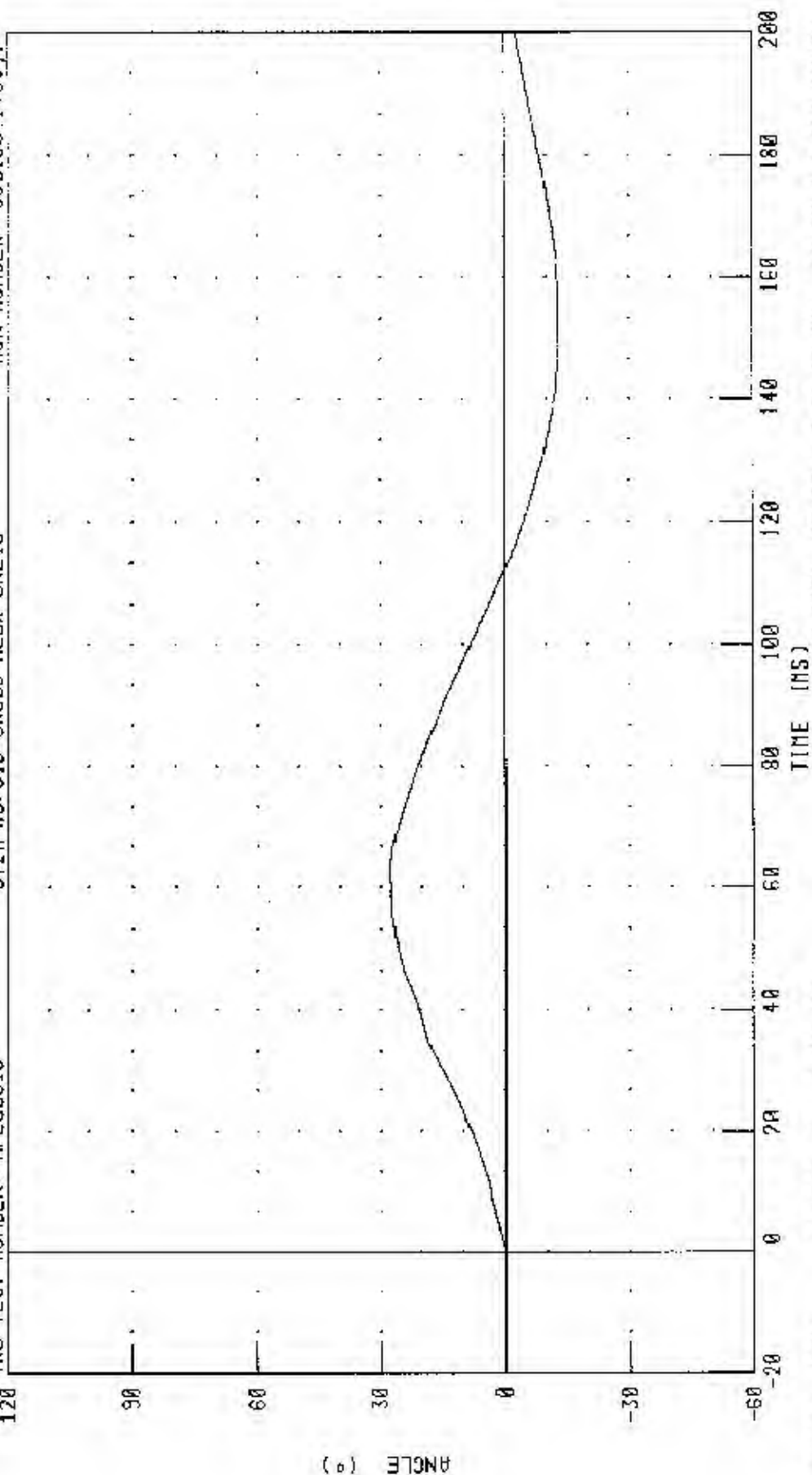
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06510

572M H3/SID SN065 NECK CAL10

RUN NUMBER: 050103.1735.1



CHANNEL: BETA

FILTER: CH. CLASS 60

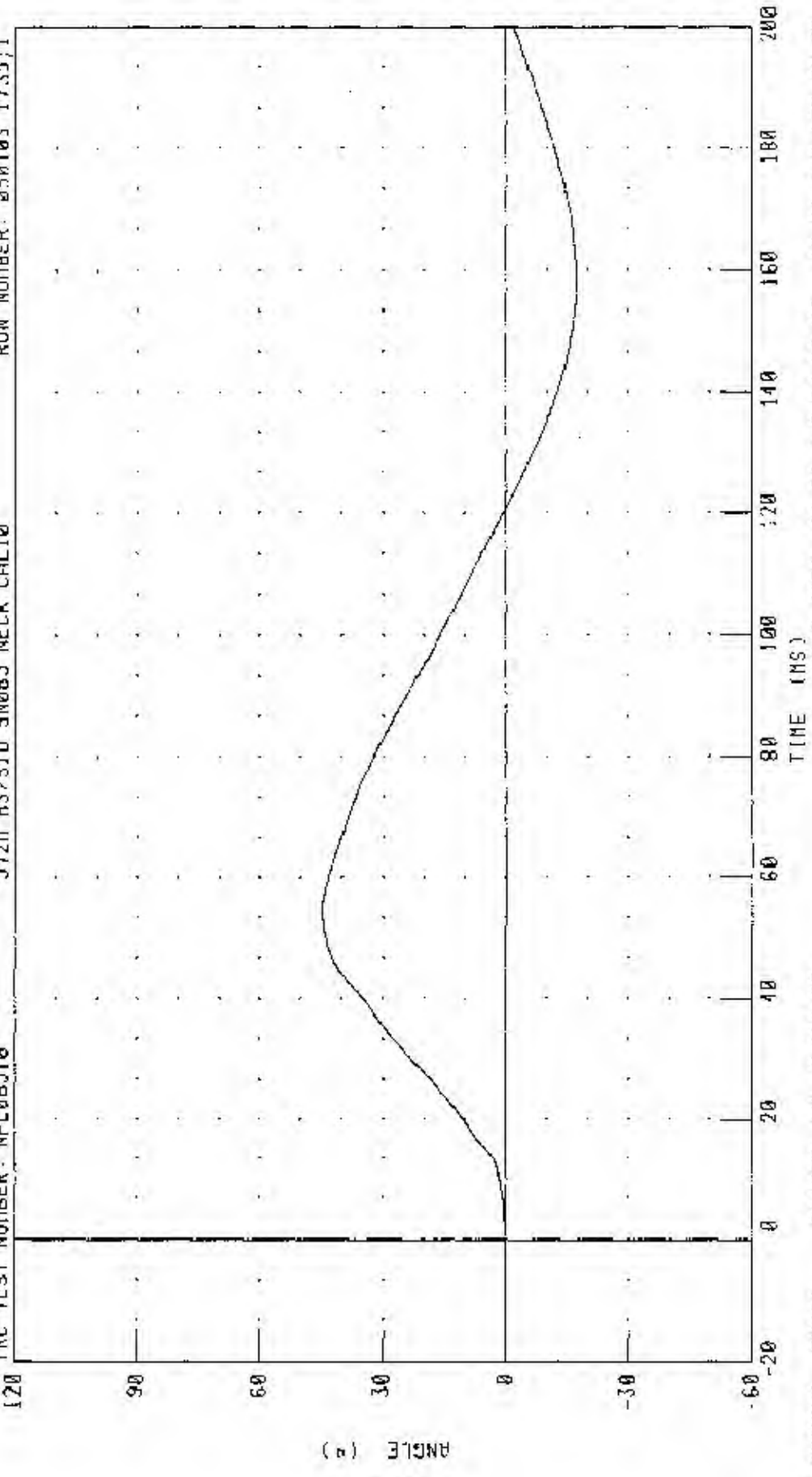
TIME (MS)

PEAK DATA: 27.85 ° @ 62.96 MS, -12.96 ° @ 154.16 MS

572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFO06510 572M H3/S10 SN065 NECK CAL10 RUN NUMBER: 050103 1735;1

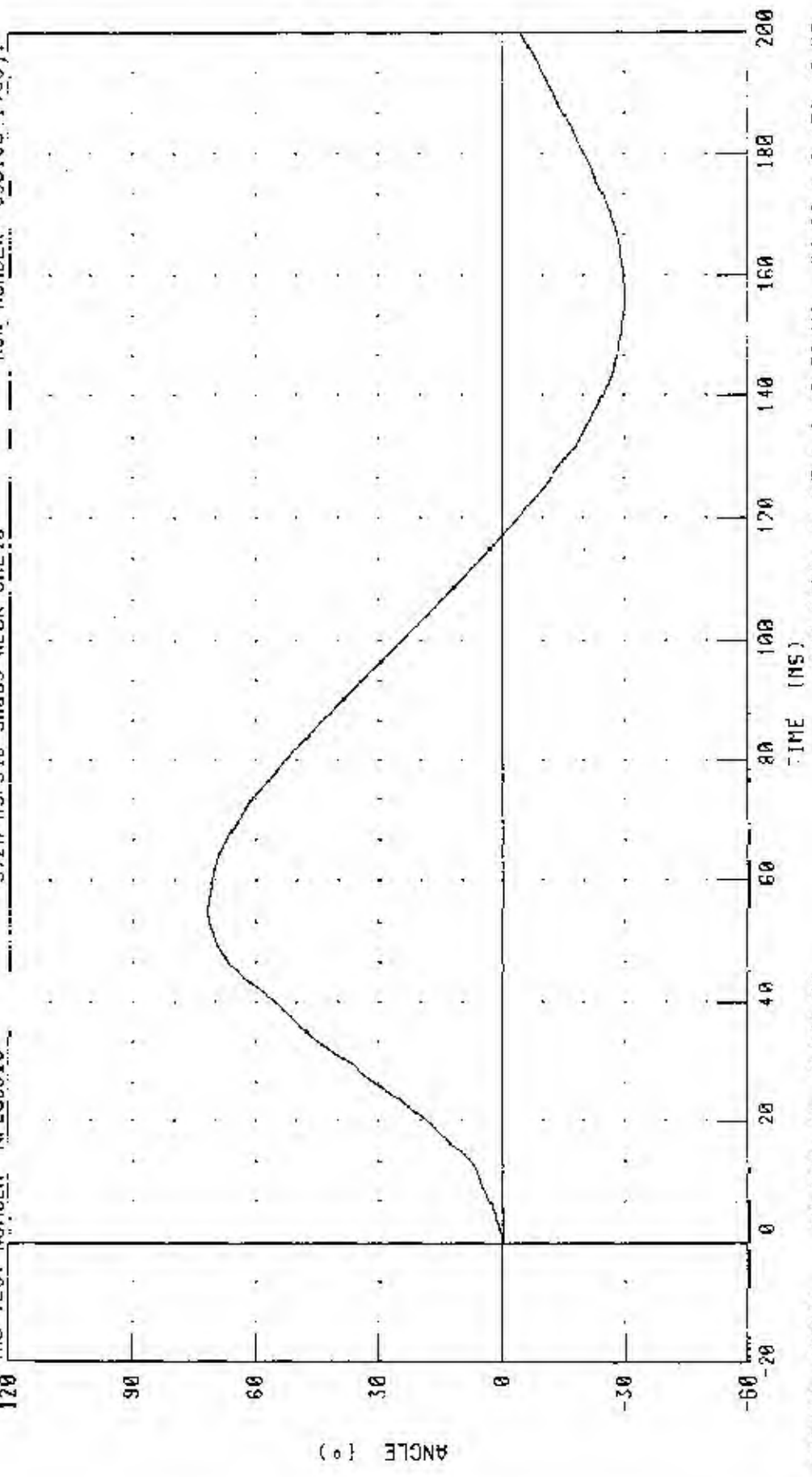


CHANNEL: THETA FILTER: CH. CLASS 80 PEAK DATA 44 64 0 0 54 56 MS, -17 21 0 0 157.76 MS

572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

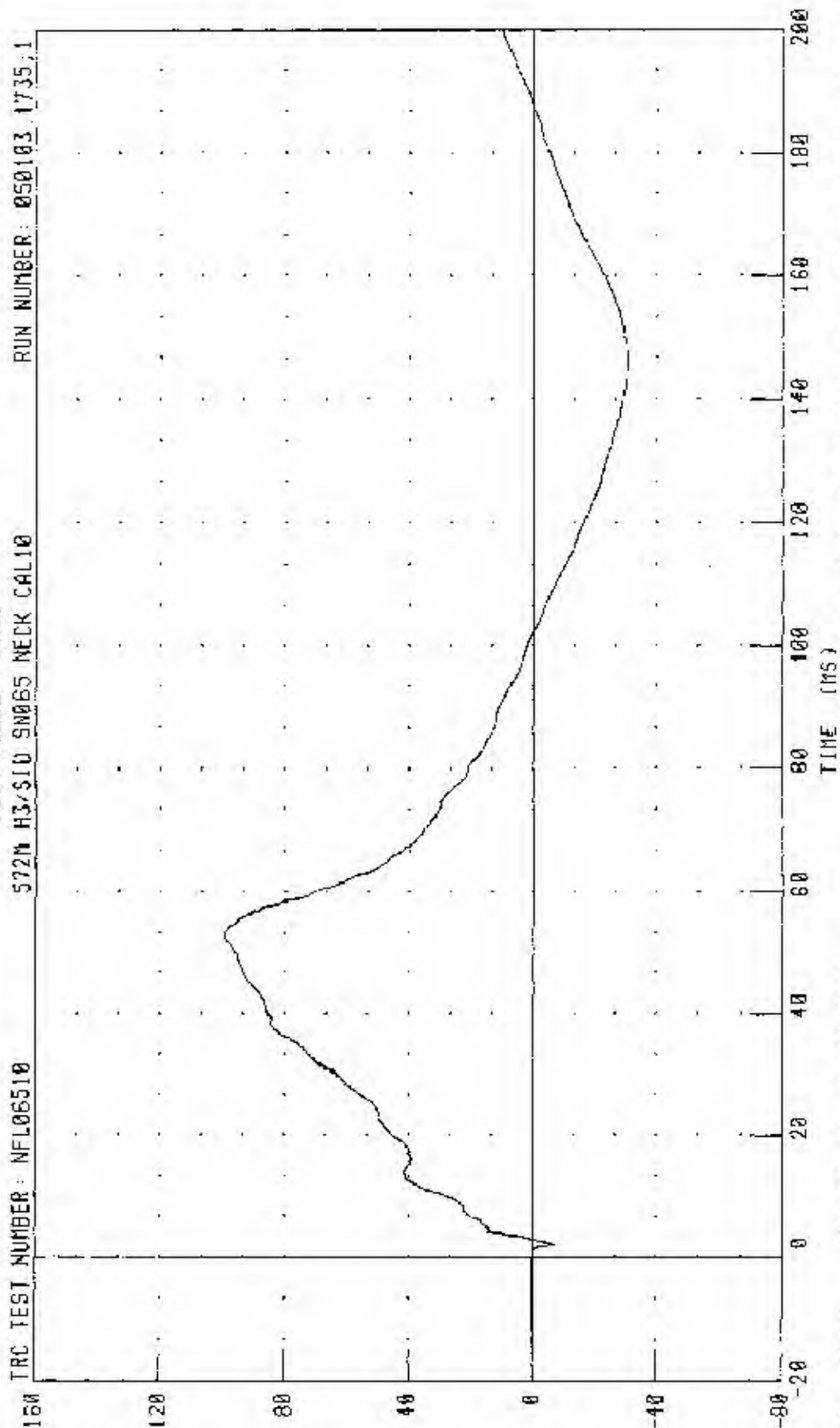
TOTAL ROTATION

IRC TEST NUMBER: NFL06510 572M H3/S10 SN065 NECK CAL10 RUN NUMBER: 050103.1735.1



CHANNEL: TOTOM FILTER: CH CLASS: 60 PEAK DATA: 71.85 ° @ 55.36 MS; -30.89 ° @ 156.48 MS

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
NECK FORCE Y AXIS



TRC TEST NUMBER: NFO06510

572M H3/SID SN085 NECK CAL10

RUN NUMBER: 050103 1735.1

PEAK DATA 995.98 N @ 52.06 MS, -302.29 N @ 145.68 MS

CHANNEL: NEKYF FILTER: CH CLASS 1000

FORCE (N X 10^1)

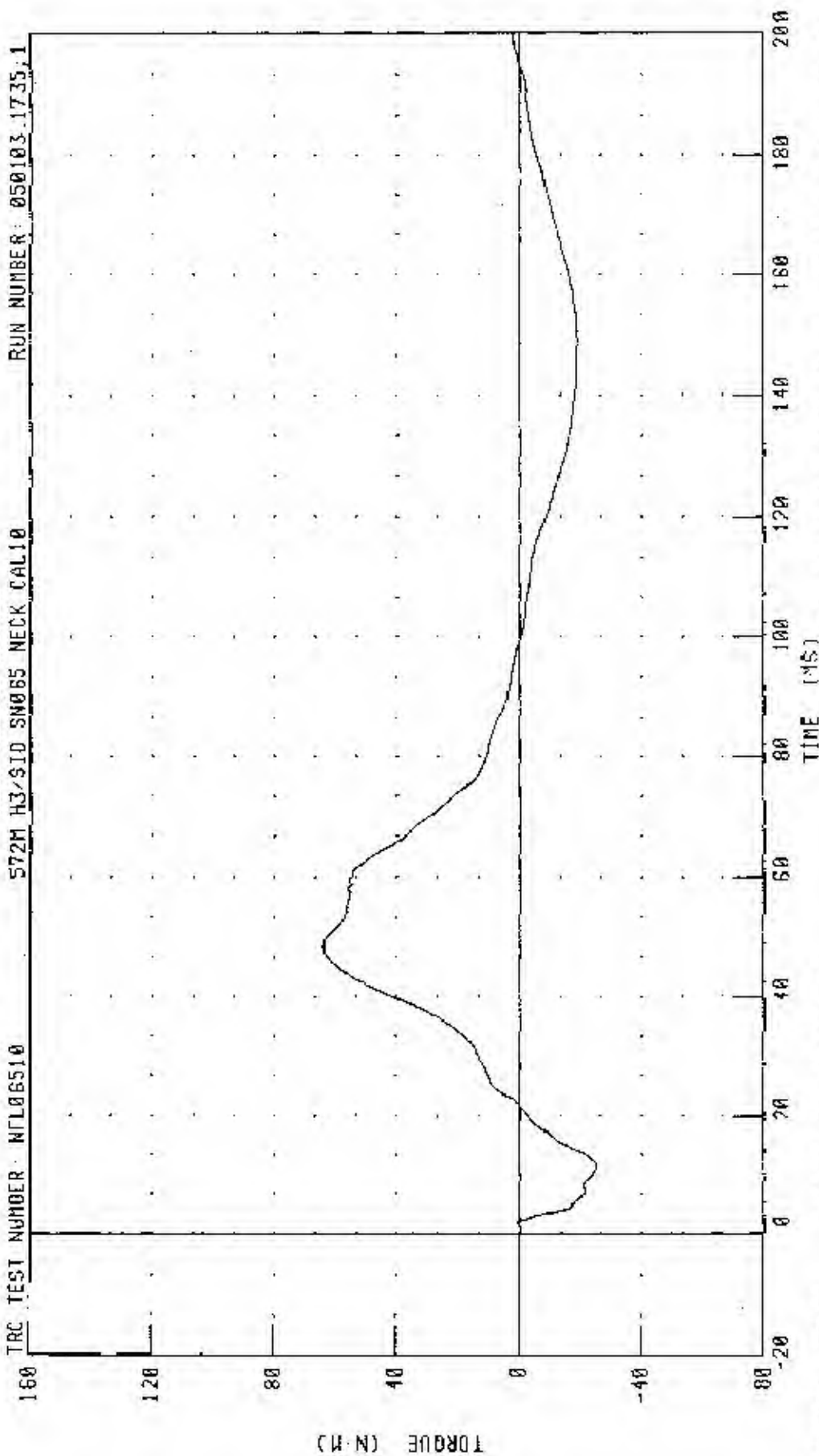
572M H3/SIO DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NTL06510

572M H3/SIO SN065 NECK CAL10

RUN NUMBER: 050103.1735.1



TIME (MS)

PEAK DATA 64.21 N-M @ 48.16 MS; -25.13 N-M @ 111.60 MS

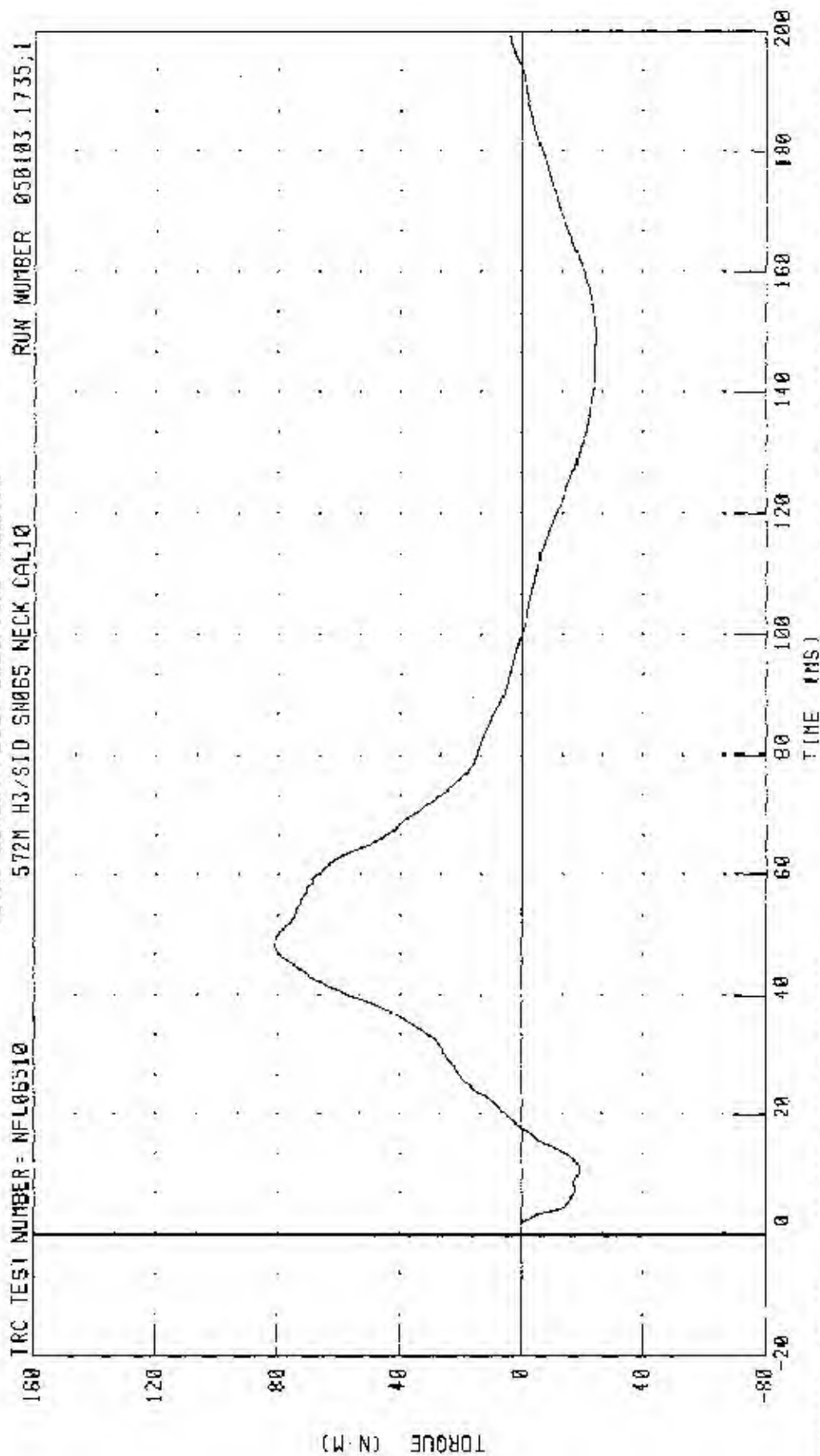
CHANNEL: NECKM FILTER CH. CLASS 600

TORQUE (N-M)

C-120

030430

572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST
 TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



TRC TEST NUMBER = NFL06510

572M H3/S10 SM065 NECK CAL10

RUN NUMBER 050103.1735.1

PEAK DATA: 90.99 N M @ 48.32 MS; -24.45 N M @ 149.44 MS

CHANNEL: NEKOM FILTER CH CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

01-JUN-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL06510

572F SID SNO65 L.THORAX CAL10

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	43.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.31 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	44.5 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	43.9 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	21.0 G

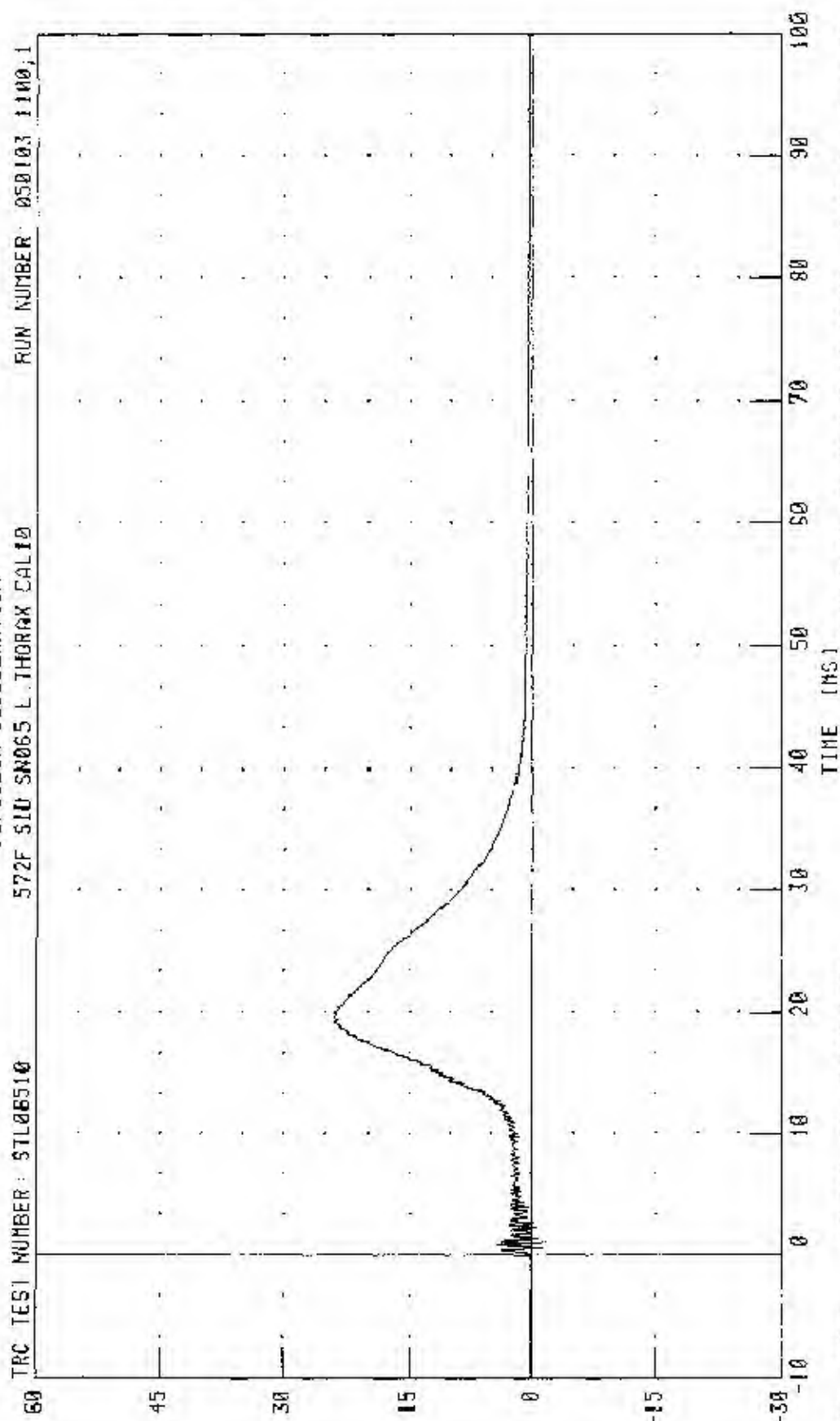
TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 050103.1059;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

FEMORAL DECELERATION



PEAK DATA: 24 08 G @ 19 60 MS; -1.89 G @ 1.04 MS

CHANNEL PENXG FILTER: CH. CLASS 1003

(C) 0011043713004

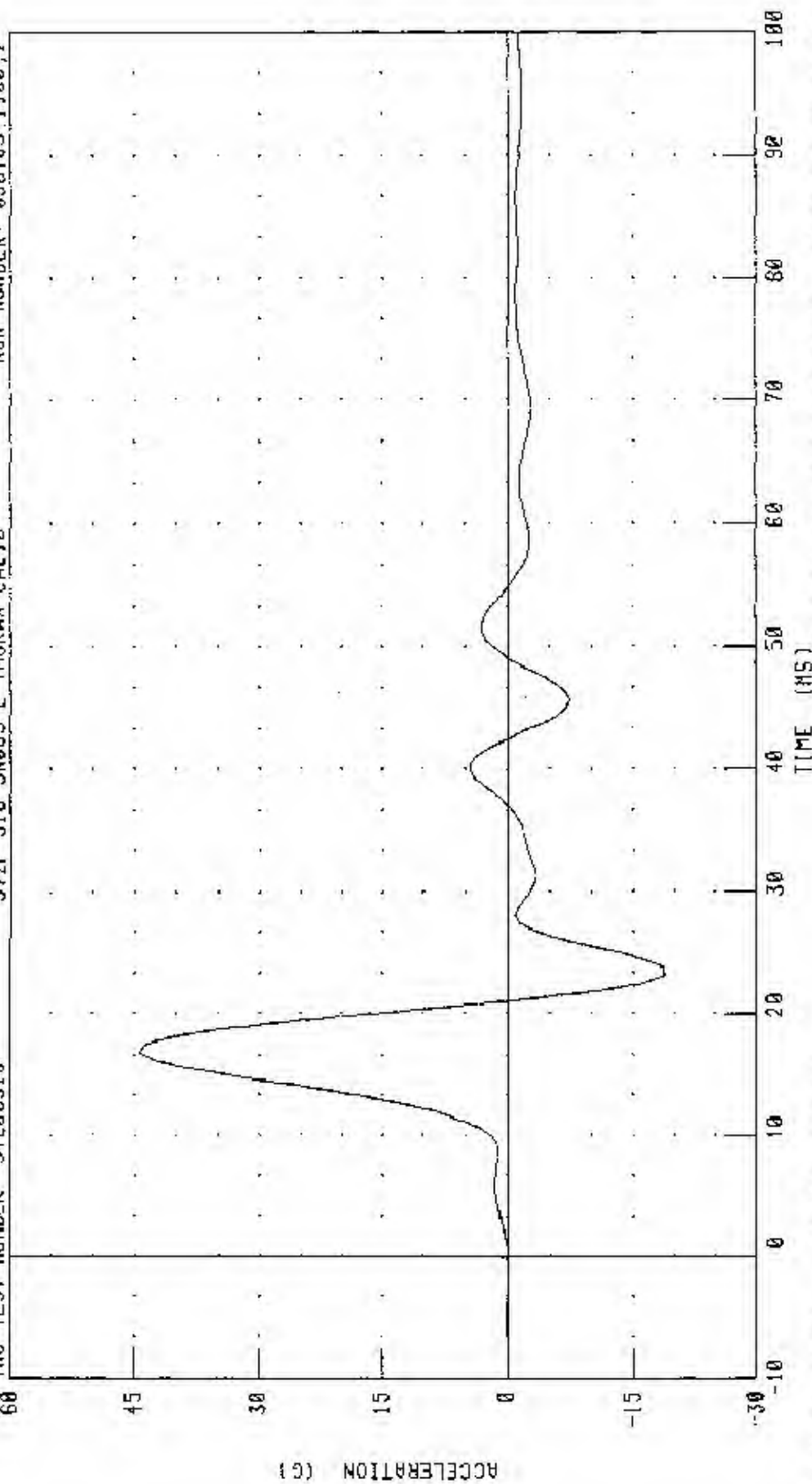
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06510

572F SIO SH055 L THORAX CAL10

RUN NUMBER: 050103.1100.1



CHANNEL: IURYG

FILTER: FTR 100

PEAK DATA: 14.40 G @ 16.87 MS, -18.76 G @ 23.13 MS

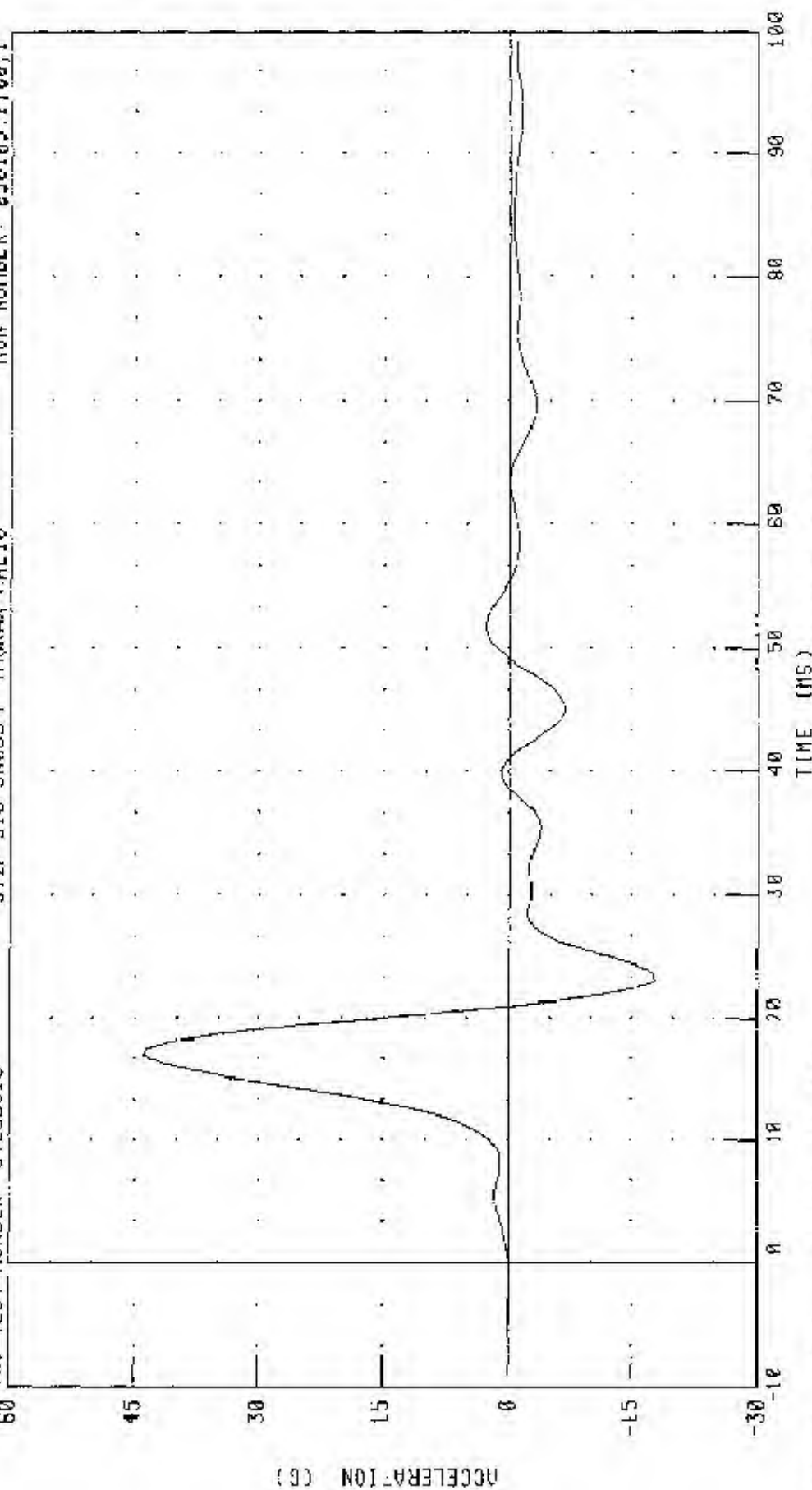
PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: ST106510

572F SID SN085 J THORAX CAL10

RUN NUMBER: 050103.1100.1



PEAK DATA: 43.93 G @ 16.87 MS; 17.80 G @ 23.13 MS

CHANNEL LLRYG FILTER FIR 100

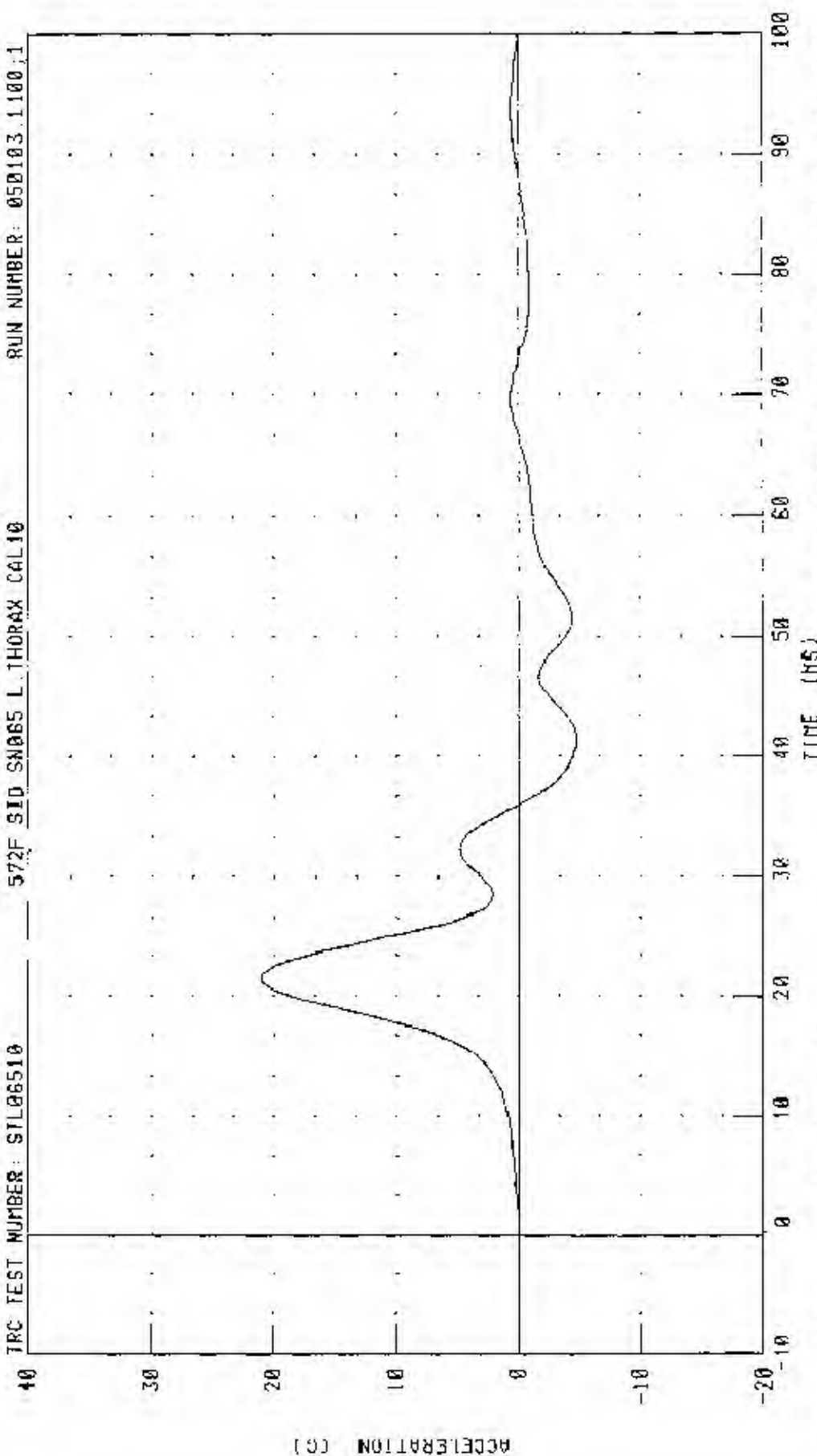
PART 572-F S I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: SYL06510

572F SID SN065 L THORAX CAL10

RUN NUMBER: 050103.1100.1



CHANNEL: T12YC FILTER: FIR 100

PEAK DATA: 20.96 G @ 21.25 MS; -4.81 G @ 41.25 MS

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST


SID PART 572B

CAL DATE: 01-May-03

TRC, INC. TEST NO: 065C10TF1 572B SN 065 TORSO FLEX CAL 10

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6° C	22.2 °C
RELATIVE HUMIDITY	10 – 70 %	43 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	133.4 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	173.5 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	226.9 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	7 °

TEST MEETS SPECIFICATIONS

TECHNICIAN 

Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 065 Calibration No. 10 - 1

Test Date 05/01/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.2 °C	Yes
Relative Humidity	10 - 70 %	43 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.4 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



05.02.2003 11:06:36 41

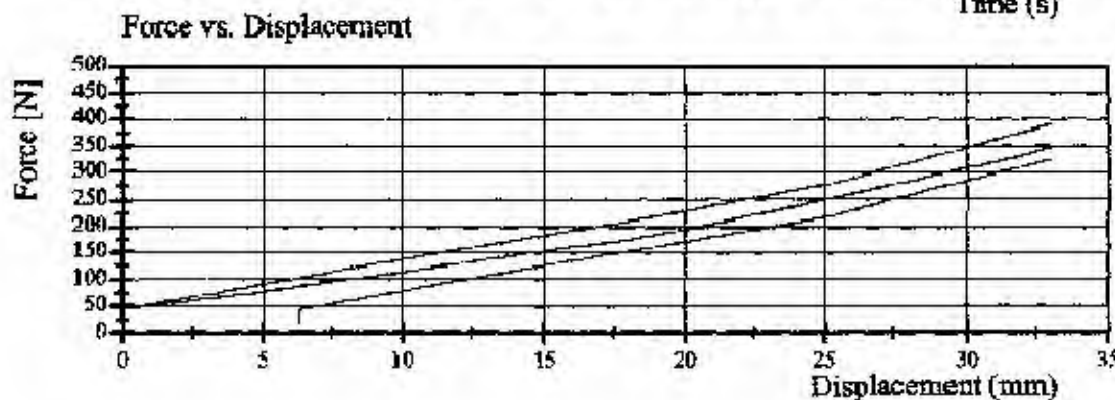
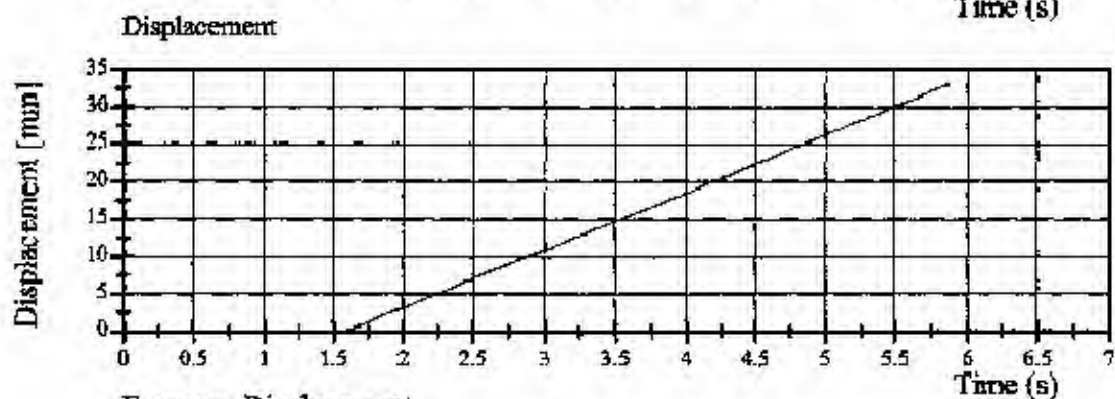
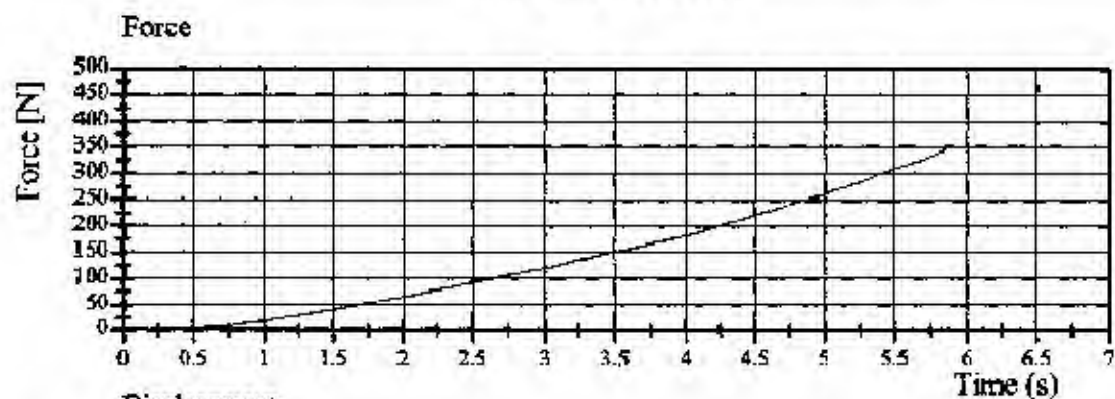


Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SED Serial No. 065 Calibration No. 10 - 1

Test Date 05/01/2003



05.02.2003 11:06:37 41



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

01-JUN-03

LEFT SIDE CONFIGURATION

TRC INC.

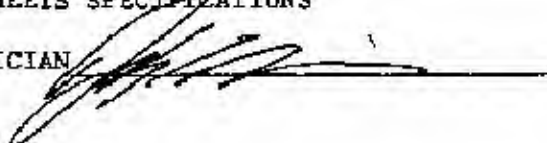
TEST NO: SPL06510

572F SNO65 LEFT PELVIS CAL10

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	43.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.28 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	54.5 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.0 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 050103.1107;1

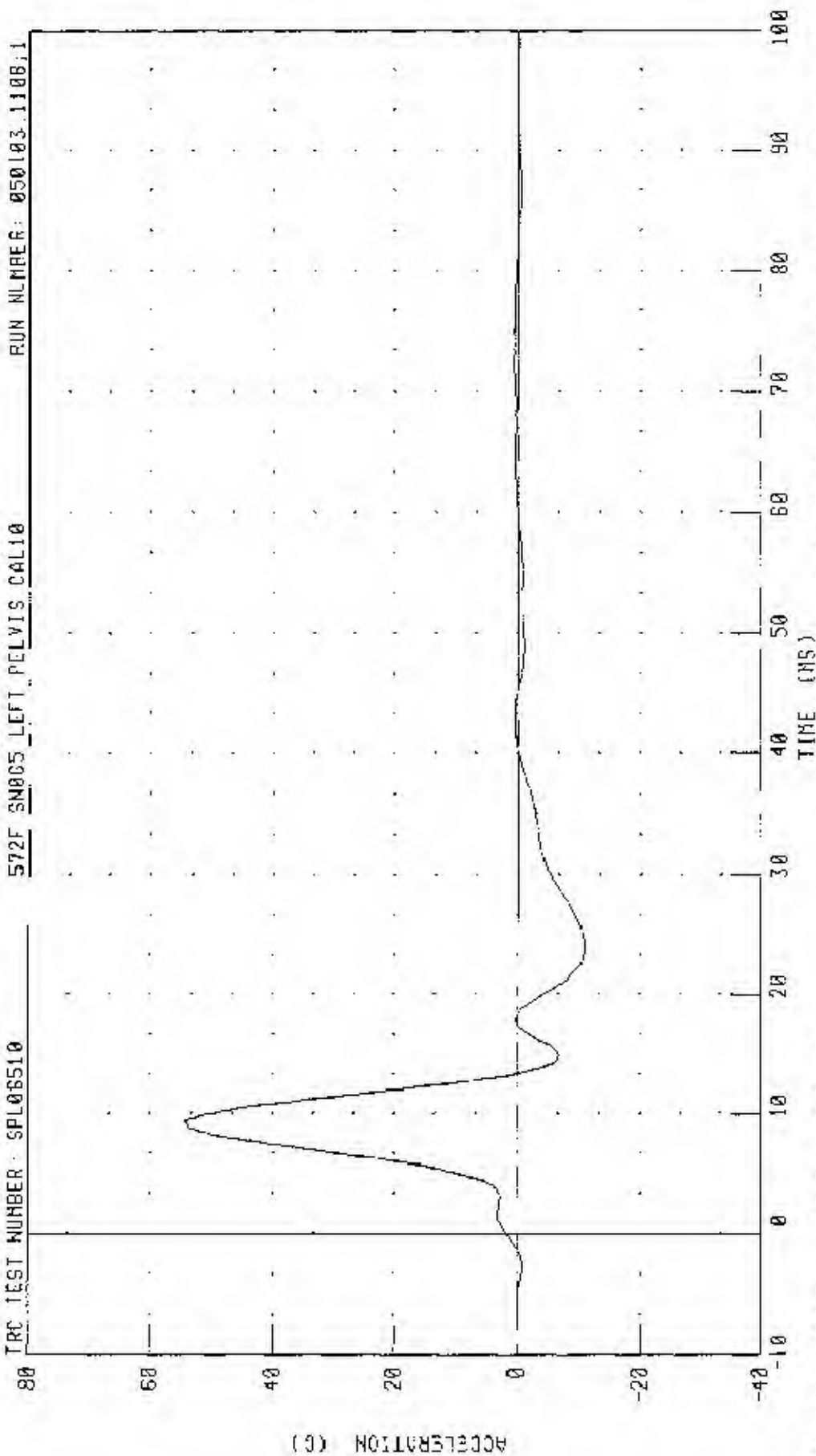
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06510

572F SN005 LEFT PELVIS CAL10

RUN NUMBER: 050103.1108.1

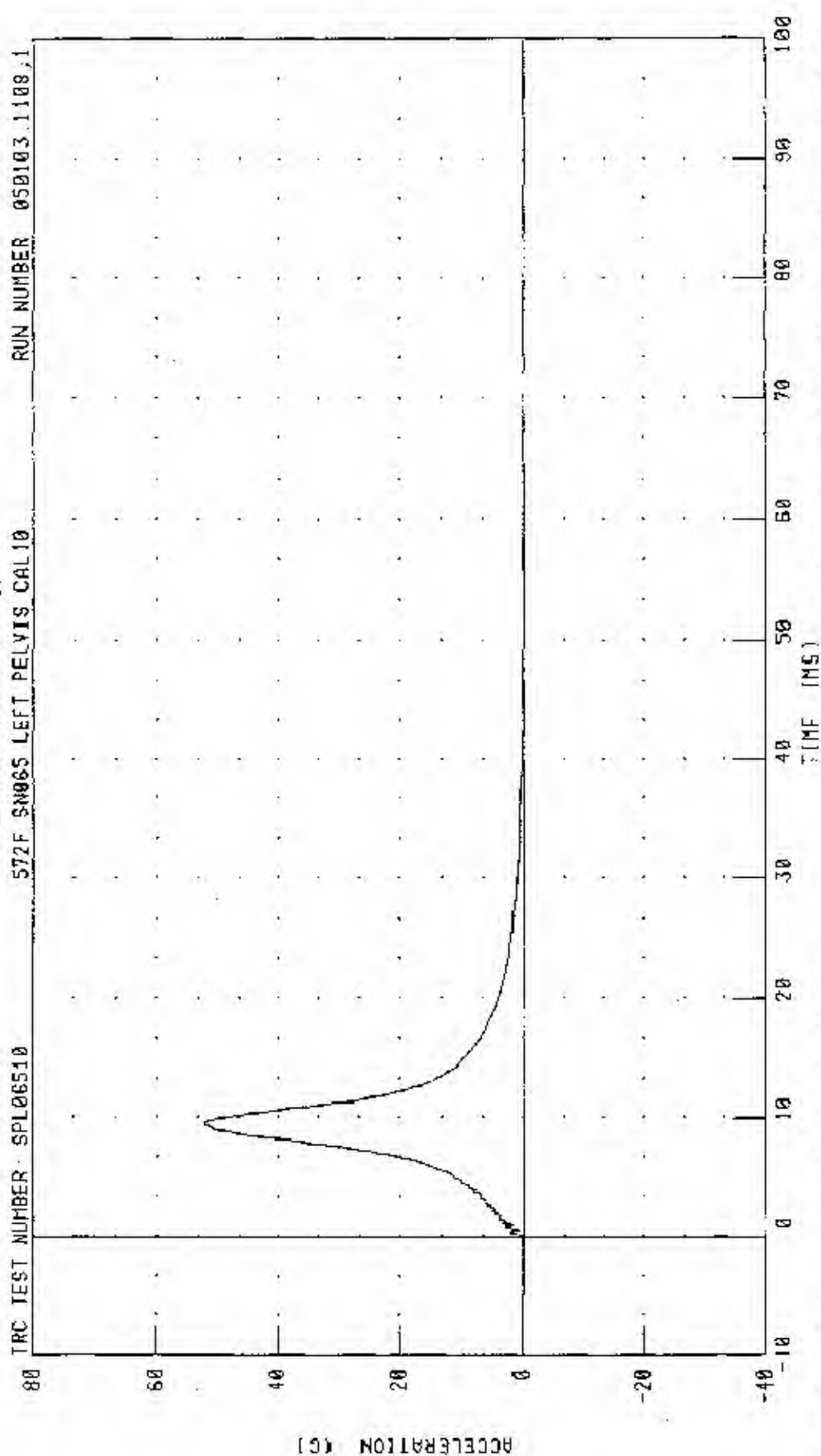


CHANNEL: PELVIC

FILTER: FIR 100

PEAK DATA: 54.52 G @ 37 NS, -10.97 G @ 24.58 NS

PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)
 PENDULUM DECELERATION



TRC TEST NUMBER: SPL06510 572F SN065 LEFT PELVIS CAL10 RUN NUMBER 050103.1108.1

CHANNEL: PENXG FILTER: CH. CLASS 1000

PEAK DATA: 52.32 G @ 9.52 MS; -0.21 G @ 62.00 MS

Transportation Research Center Inc.

SID Pre-Use Inspection

Type: HIII SID S/N: 028 Mfr: Vector Test Date: 04/30/03

Proj./Seg. No.: 20020455-1150 Test Eng.: Ginny Watters

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left)	(Right) N/A
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX: Left Side Configuration		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyehol	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (40 ft/lbs)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge Date: 04/21/03

Transportation Research Center Inc.

SID Pre-Use Inspection

Type: HIH SID S/N: 065Mfr: DentonTest Date: 04/30/03Proj./Seg. No.: 20020455-1150Test Eng.: Ginny Watters

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left)	(Right) N/A
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX: Left Side Configuration		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (40 ft/lbs)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. ClarridgeDate: 04/28/03

Transportation Research Center Inc.

SID Post-Use Inspection

Type: HIII SID S/N: 028 Mfr: Vector Test Date: 04/30/03

Proj./Seg. No.: 20020455-1150 Test Eng.: Ginny Watters

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX: Left Side Configuration	
Jacket Condition	*
Arm Foam Condition	X
Damper and Chest Pot Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: Re-glued right side jacket (bottom of zipper coming loose)

No other damage to report.

Inspection Completed By: J. Clarridge

Date: 05/01/03

Transportation Research Center Inc.

SID Post-Use Inspection

Type: HILL SID S/N: 065 Mfr: Denton Test Date: 04/30/03

Proj./Seg. No.: 20020455-1150 Test Eng.: Ginny Watters

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX: Left Side Configuration	
Jacket Condition	X
Arm Foam Condition	X
Damper and Chest Pot Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: No damage to report.

Inspection Completed By: J. Clarridge

Date: 05/01/03

Appendix D

Test Equipment List and Calibration Information

Sign Convention
SAE J211 MAR95

Accelerometers:

+X: Forward
+Y: Rightward
+Z: Downward

Potentiometers:

+Chest longitudinal deflection: Outward
+Chest lateral deflection: Rightward
+Seat belt displacement: Outward
+Seat belt extension: Elongation
+Knee slider displacement: Distance between femur and tibia
increased (in relation to a seated
dummy)

Rotation potentiometers:

+About the X-axis: Left foot-eversion
Right foot-inversion
+About the Y-axis: Left/right foot-dorsiflexion
+About the Z-axis: Left foot-internal
Right foot-external

Load cells:

+Femur force: Tension
+Seat belt force: Tension
+Barrier force: Tension

Neck load cells:

+X force: Head pushed rearward
+Y force: Head pushed leftward
+Z force: Head pulled upward (tension on neck)
+X moment: Left ear rotating toward left shoulder
+Y moment: Chin rotating toward chest
+Z moment: Chin rotating toward left shoulder

Tibia load cells:

+X force: Ankle forward, knee rearward
+Y force: Ankle rightward, knee leftward
+Z force: Tension
+X moment: Bottom of tibia moving leftward
+Y moment: Bottom of tibia moving rearward

Sign Convention, Cont'd.
SAE J211 MAR95

Lumbar load cells: +X force: Chest rearward, pelvis forward
 +Y force: Chest leftward, pelvis rightward
 +Z force: Chest upward, pelvis downward
 +X moment: Left shoulder toward left hip
 +Y moment: Sternum toward front of legs
 +Z moment: Right shoulder forward, left shoulder rearward

Frequency Response Classes
SAE J211 MAR95

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	600
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. The polarity column indicates whether a polarity change occurred during data acquisition to conform to J211 MAR95. See Report Sign Convention sheet for description of data output as presented in the report; occasionally channels have been adjusted in post-acquisition processing to conform to J211 MAR95.

Channel Report

4/30/2003 8:13:06 AM

Name of Test 030430

Name of DAU DAUA

System MINIDAU

Chan.#	Sensor #	Mnemonic	Description	System	Dir.	Range	Pol. Cal.	Group	Mfg.	Model
0001	P25307	HEDXG1	Head Accel X		Rwd	809.10240	- 1/22/2003	OK	Endevco	7264C-2K-2-180
0002	P25326	HEDYG1	Head Accel Y		Lft	808.84676	- 1/22/2003	OK	Endevco	7264C-2K-2-180
0003	P25298	HEDZG1	Head Accel Z		Up	807.64741	- 1/22/2003	OK	Endevco	7264C-2K-2-180
0004	P25318	HEDXR1	Head Accel X Red		Rwd	810.61397	- 1/22/2003	OK	Endevco	7264C-2K-2-180
0005	P25301	HEDYR1	Head Accel Y Red		Lt	802.80983	- 1/22/2003	OK	Endevco	7264C-2K-2-180
0006	P25305	HEDZR1	Head Accel Z Red		Up	807.23993	- 1/21/2003	OK	Endevco	7264C-2K-2-180
0007	1716A-1535-FX	NEKXF1	Neck Force X		Hd	889.17626	- 3/21/2003	OK	Denton	1716A
0008	1716A-1535-FY	NEKYF1	Neck Force Y		Hd	888.91703	+ 3/21/2003	OK	Denton	1716A
0009	1716A-1535-FZ	NEKZF1	Neck Force Z		Hd	133.58.833	+ 3/21/2003	OK	Denton	1716A
0010	1716A-1535-MX	NEKXM1	Neck Moment X		Rt Ear	282.62505	- 3/21/2003	OK	Denton	1716A
0011	1716A-1535-MY	NEKYM1	Neck Moment Y		Chn	283.29670	+ 3/21/2003	OK	Denton	1716A
0012	1716A-1535-MZ	NEKZM1	Neck Moment Z		Chn	282.83189	+ 3/21/2003	OK	Denton	1716A
0013	P25231	LURYG1	Left Upper Rib Y		Rgt	806.24842	+ 12/13/2002	OK	Endevco	7264C-2K-2-180
0014	J27507	LURYR1	Left Upper Rib Red Y		Rgt	808.38701	+ 3/18/2003	OK	Endevco	7264-2KM57
0015	P25075	L1RYG1	Left Lower Rib Y		Rgt	801.25195	+ 12/19/2002	OK	Endevco	7264C-2K-2-180
0016	P25076	L1RYR1	Left Lower Rib Red Y		Rgt	797.43326	+ 12/19/2002	OK	Endevco	7264C-2K-2-180
0017	P25261	T12YG1	Lower Spine Y		Lt	401.56862	- 11/21/2002	OK	Endevco	7264C-2K-2-180
0018	P25374	T12YR1	Lower Spine Red Y		Lt	396.97923	- 12/19/2002	OK	Endevco	7264C-2K-2-180
0019	P25063	PEVYG1	Pelvis Accel Y		Lt	400.40353	- 12/19/2002	OK	Endevco	7264C-2K-2-180
0020	P25074	PEVYR1	Pelvis Accel Red Y		Lt	397.60196	- 12/19/2002	OK	Endevco	7264C-2K-2-180
0021	J27271	HEDXG4	Head Accel X		Rwd	800.50031	- 3/11/2003	OK	Endevco	7264-2000TZ
0022	J27352	HEDYG4	Head Accel Y		Lt	793.42941	- 3/11/2003	OK	Endevco	7264-2000TZ
0023	J27283	HEDZG4	Head Accel Z		Up	809.34541	- 3/11/2003	OK	Endevco	7264-2000TZ
0024	J29134	HEDXR4	Head Accel X Red		Rwd	793.89691	- 3/11/2003	OK	Endevco	7264-2000TZ
0025	J29020	HEDYR4	Head Accel Y Red		Lt	802.35692	- 3/11/2003	OK	Endevco	7264-2000TZ
0026	J27322	HEDZR4	Head Accel Z Red		Up	814.06811	- 3/11/2003	OK	Endevco	7264-2000TZ
0027	1716-0627-FX	NEKXF4	Neck Force X		Hd	890.5691	- 3/10/2003	OK	Denton	1716
0028	1716-0627-FY	NEKYF4	Neck Force Y		Hd	890.4.8480	+ 3/10/2003	OK	Denton	1716
0029	1716-0627-FZ	NEKZF4	Neck Force Z		Hd	13361.202	+ 3/10/2003	OK	Denton	1716
0030	1716-0627-MX	NEKXM4	Neck Moment X		Rt Ear	282.90624	- 3/10/2003	OK	Denton	1716
0031	1716-0627-MY	NEKYM4	Neck Moment Y		Chn	282.62862	+ 3/10/2003	OK	Denton	1716
0032	1716-0627-MZ	NEKZM4	Neck Moment Z		Chn	282.46679	+ 3/10/2003	OK	Denton	1716

Channel Report

4/30/2003 8:13:07 AM

Name of Test 030430

System MINIDAU

Name of DAU DAUB

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol. Cal.	Group	Mfg.	Model
0001	P25068	LURYG4	Left Upper Rib Y	Rgt	804.05798	-	065nlr	Endevco	7264C-2K-2-180
0002	P25067	LURYR4	Left Upper Rib Red Y	Rgt	808.88309	+	065nlr	Endevco	7264C-2K-2-180
0003	P25389	LURYG4	Left Lower Rib Y	Rgt	799.52528	-	065nlr	Endevco	7264C-2K-2-180
0004	P25395	LURYR4	Left Lower Rib Red Y	Rgt	788.95463	+	065nlr	Endevco	7264C-2K-2-180
0005	P14826	T12YC4	Lower Spine Y	Lft	401.80813	-	065nlr	Endevco	7264C-2K-2-180
0006	P25069	T12YR4	Lower Spine Red Y	Lft	398.15851	-	065nlr	Endevco	7264C-2K-2-180
0007	P25397	PEVYG4	Pelvis Accel Y	Lft	400.34404	-	065nlr	Endevco	7264C-2K-2-180
0008	P25061	PEVYR4	Pelvis Accel Red Y	Lft	401.07161	+	065nlr	Endevco	7264C-2K-2-180
0009	03D03C27-N26	RFSXG1	RGT SIDE SILL FRNT ST X	FWD	402.51572	-	-1	Endevco	EGE-73B6Q-200
0010	03D03C27-N22	RFSYG1	RGT SIDE SILL FRNT ST Y	LT	989.37198	-	-1	Endevco	EGE-73B6Q-200
0011	03D03C27-N18	RFSZG1	RGT SIDE SILL FRNT ST Z	UP	401.60012	-	-1	Endevco	EGE-73B6Q-200
0012	333398	RFSXG1	RGT SIDE SILL RR ST X	FWD	401.92799	+	-1	Endevco	EGE-73B6Q-200
0013	P23149	RFSYG1	RGT SIDE SILL RR ST Y	LT	996.10894	-	-1	Endevco	EGE-73B6Q-200
0014	P23201	RFSZG1	RGT SIDE SILL RR ST Z	UP	397.08391	-	-1	Endevco	EGE-73B6Q-200
0015	03D03C27-N24	RDKXG1	RR FLR PAN ABV AXLE X	FWD	1018.9054	+	-1	Endevco	EGE-73B6Q-200
0016	03C03C14-N26	RDKYGI	RR FLR PAN ABV AXLE Y	LT	1015.0674	-	-1	Endevco	EGE-73B6Q-200
0017	03C03C14-N07	RDKZGI	RR FLR PAN ABV AXLE Z	UP	984.61538	-	-1	Endevco	EGE-73B6Q-200
0018	P25257	LRSYG1	LFT SIDE SILL RR ST Y	RT	996.30278	+	-1	Endevco	EGE-73B6Q-200
0020	333401	LFSYG1	LFT SIDE SILL FRNT ST Y	RT	1012.3178	-	-1	Endevco	EGE-73B6Q-200
0021	P26430	RRTYGI	RGT RR OCP COMP Y	RT	1468.5214	+	-1	Endevco	EGE-73B6Q-200
0022	337150	LLDYGI	LFT LOWER B-POST Y	RT	1545.0540	+	-1	Endevco	EGE-73B6Q-200
0023	334877	LUBYGI	LFT MID B-POST Y	RT	1443.7175	+	-1	Endevco	EGE-73B6Q-200
0024	335808	LLAYGI	LFT LOWER A-POST Y	LT	1468.1424	-	-1	Endevco	EGE-73B6Q-200
0025	312724	LJAYGI	LFT MID A-POST Y	LT	1550.3875	+	-1	Endevco	EGE-73B6Q-200
0026	03D03C28-N17	LFTYGI	LFT FRNT ST TRK Y	RT	1549.6368	+	-1	Endevco	EGE-73B6Q-200
0027	334118	LRTYGI	LFT RR ST TRK Y	RT	1499.4435	+	-1	Endevco	EGE-73B6Q-200
0028	03C03C14-F01	VCGXG1	VEH C/G X	FWD	1008.8669	+	-1	Endevco	EGE-73B6Q-200
0029	03C03C14-F21	VCGYGI	VEH C/G Y	RT	1015.8730	-	-1	Endevco	EGE-73B6Q-200
0030	03C03C14-F24	VCGZG1	VEH C/G Z	UP	1020.7336	-	-1	Endevco	EGE-73B6Q-200

030430

Channel Report

4/30/2003 8:13:07 AM

Name of Test 030430

Name of DAU DAUC

System MINIDAU

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0001	P23188	BCGXG1	MDB CG X-AXIS	FWD	599.46142	B	+ 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0002	P23380	BCGYG1	MDB CG Y-AXIS	RT	603.49603	B	+ 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0003	P23416	BCGZG1	MDB CG Z-AXIS	UP	594.90611	B	- 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0004	P23362	LRRXG1	MDB LT RR X-AXIS	RR	606.49135	B	- 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0005	P23460	LRRYG1	MDB LT RR Y-AXIS	RT	605.37268	B	+ 3/3/2003	OK -1	Endevco	7264C-2K-2-180
0006	EVENT	EVENT	EVENT		5.12	V	+ 10/15/2002	OK -1	TRC	Event

Digital and System Channel Report

Name of Test	030430	enable Channel	Short Name	System	MINIDAU	Name of DAI	DAUC	description
		Yes	DIOC	dig0			DAUC0501	KM3710 Controller
bit position	bit		short		long			description
MSB = bit 15	1		MDRR1					R
bit 14	1		MDBL1					L
bit 13	0							
bit 12	0							
bit 11	0							
bit 10	0							
bit 09	0							
bit 08	0							
bit 07	0							
bit 06	0							
bit 05	0							
bit 04	0							
bit 03	0							
bit 02	0							
bit 01	0							
LSB = bit 00	0							

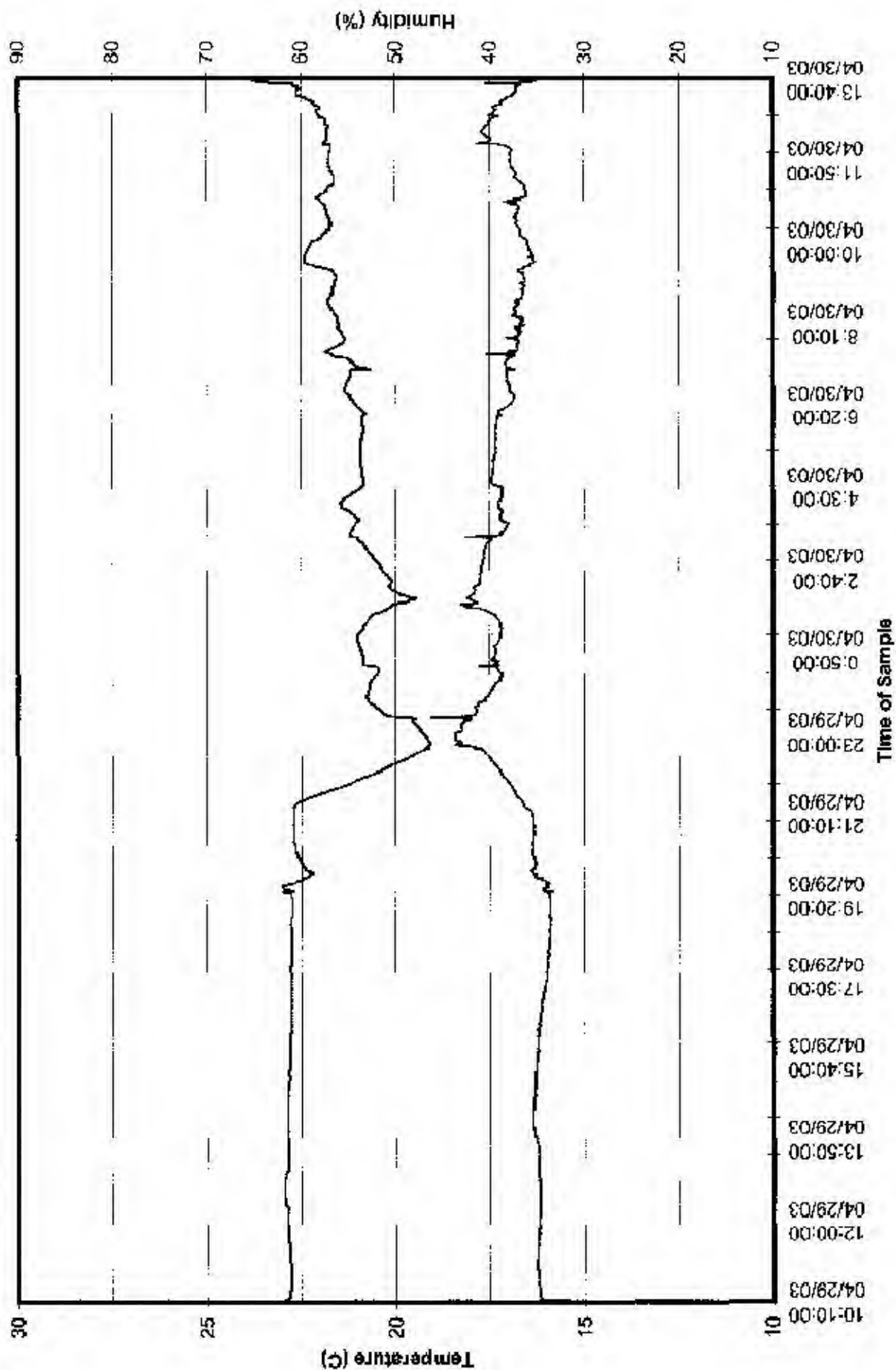
Dummy 028n/r Type SID/H3 Description Name Model

NHTSA - 028n SID-LEFT IMP. CONFIG. w/RED ACCELIS CAL DUE 6-19-03(DKS)

028n/r

Chsnum	Location	Name	Manufacturer	Sens./mV/V	Fullscal	Calcat	Pos Output	Flip
HEDXC	Head Accel X	7264C-2K-2-18 P25307	Endevco	0.01808	2000	1/22/2003	Rwd	1
HEDYC	Head Accel Y	7264C-2K-2-18 P25326	Endevco	0.0211	2000	1/22/2003	Lt	1
HEDZG	Head Accel Z	7264C-2K-2-18 P25298	Endevco	0.02186	2000	1/22/2003	Up	1
HEDXR	Head Accel X Red	7264C-2K-2-18 P25318	Endevco	0.01914	2000	1/22/2003	Rwd	1
HEDYR	Head Accel Y Red	7264C-2K-2-18 P25301	Endevco	0.01993	2000	1/22/2003	Lt	1
HEDZR	Head Accel Z Red	7264C-2K-2-18 P25305	Endevco	0.02046	2000	1/21/2003	Up	1
NEKXF	Neck Force X	1716A-1535-FX	Denton	0.000185746	8896.4	3/21/2003	Hd Hd.Cst Rr	1
NEKYF	Neck Force Y	1716A-1535-FY	Denton	0.000181126	8896.4	3/21/2003	Jld Lt.Cst Rr	0
NEKZF	Neck Force Z	1716A-1535-FZ	Denton	0.000093708	11344.6	3/21/2003	Hd Up.Cst Dn	0
NEKXM	Neck Moment X	1716A-1535-MX	Denton	0.00380637	282.5	3/21/2003	Rt Ear to Rt Shld	1
NEKYM	Neck Moment Y	1716A-1535-MY	Denton	0.005701238	282.5	3/21/2003	Chn to Simm	0
NEKZM	Neck Moment Z	1716A-1535-MZ	Denton	0.008154336	282.5	3/21/2003	Chn to Lt Shld	0
LURYG	Left Upper Rib Y	7264C-2K-2-18 P25231	Endevco	0.01764	2000	12/13/2002	Rgt	0
LURYR	Left Upper Rib Red Y	7264-2KM5T J27507	Endevco	0.02639	2000	3/18/2003	Rgt	0
LURYG	Left Lower Rib Y	7264C-2K-2-18 P25075	Endevco	0.01775	2000	12/19/2002	Rgt	0
LURYR	Left Lower Rib Red Y	7264C-2K-2-18 P25076	Endevco	0.01566	2000	12/19/2002	Rgt	0
L12YG	Lower Spine Y	7264C-2K-2-18 P25261	Endevco	0.017	2000	11/21/2002	Lt	1
L12YR	Lower Spine Red Y	7264C-2K-2-18 P25374	Endevco	0.02186	2000	12/19/2002	Lt	1
PEVYG	Pelvis Accel Y	7264C-2K-2-18 P25063	Endevco	0.01801	2000	12/19/2002	Lt	1
PEVYR	Pelvis Accel Red Y	7264C-2K-2-18 P25074	Endevco	0.01764	2000	12/19/2002	Lt	1

Side Impact Protection Compliance Test/C30512





SIDE IMPACTOR BARRIER CERTIFICATION

Date: April 1, 2003
To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION


Customer P.O. Number: 22964
Work Order Number: 16444
Quantity: 01 piece

CORE INFORMATION

Core Type: PCGA-1/4-5.2-P-3003-T
Measured Cell Size: 0.250 inches
Measured Density: 5.2 pcf

Unit Number: 013C0203

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 232 - 250 psi as per DWG# DSL-1285.


Quality Control Representative
Karl D. Zwaanstra





PLAScore

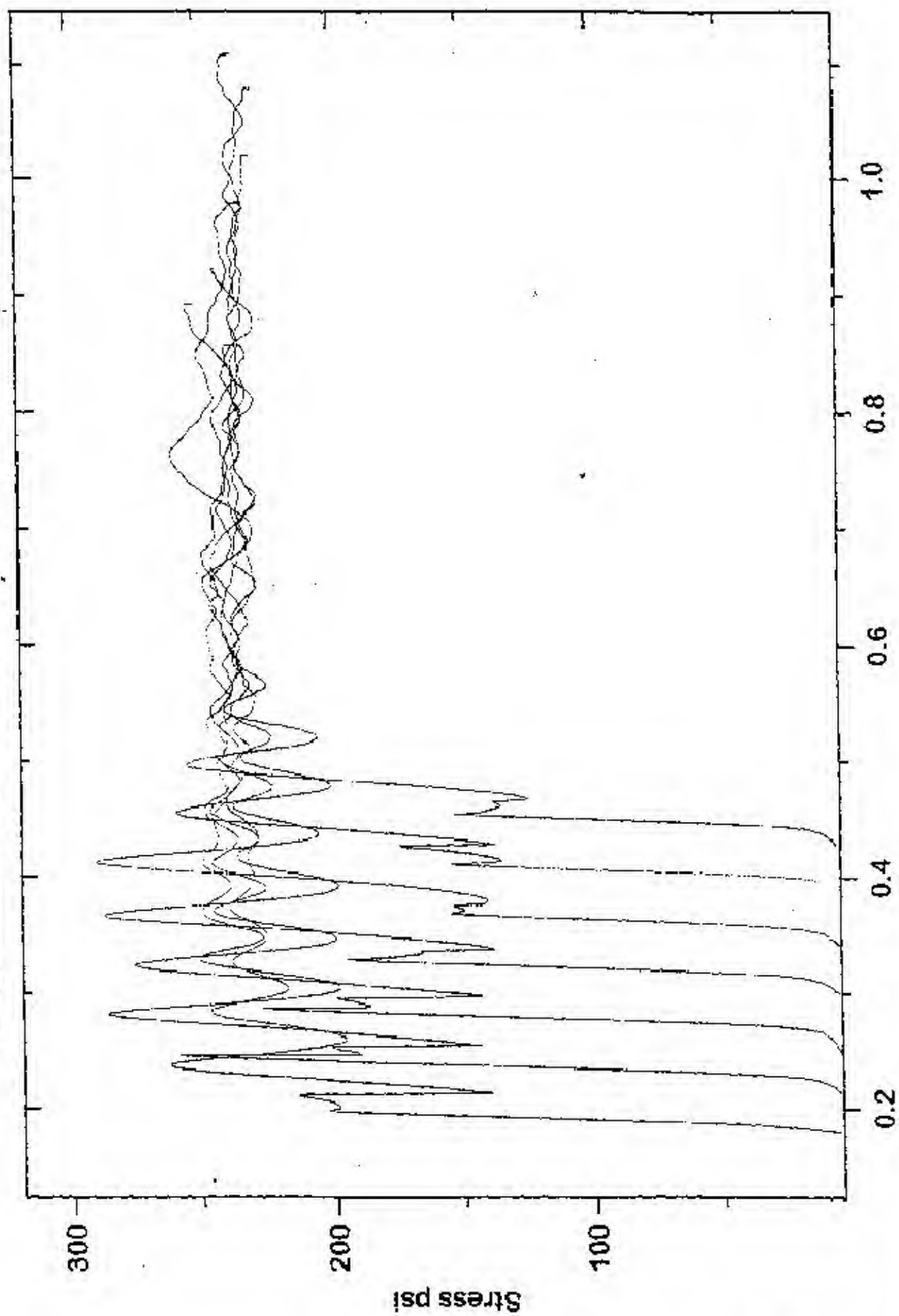
Crush Data

232 - 250 psi per DWG # DSL-1285

Block Number: 013C0203

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	233.48	233.35	237.86
2	242.12	244.14	240.86
3	240.11	239.69	235.51
4	239.95	247.24	244.81
5	236.72	235.46	235.51
6	233.23	233.94	234.72
7	235.06	233.80	236.57

BLOCK # 013C0203 Sample ID: IN226629





PLASCORE

SIDE IMPACTOR BARRIER CERTIFICATION

Date: April 1, 2003
To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

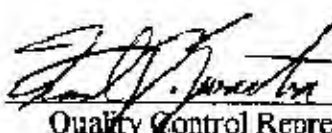
Customer P.O. Number: 22964
Work Order Number: 16444
Quantity: 01 piece

CORE INFORMATION

Core Type: PAMG-3/8-1.6-001-P-5052-T
Measured Cell Size: 0.375 inches
Measured Density: 1.6 pcf

Unit Number: 018A0303

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 45 psi +/- 2.5 psi as per DWG# DSL-1285.


Quality Control Representative
Karl D. Zwaanstra





PLASCORE

Crush Data

45 psi +/- 2.5 psi per DWG # DSL-1285

Block Number: 018A0303

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	47.24	46.77	46.95
2	47.27	47.03	47.09
3	46.53	46.87	45.83
4	46.33	46.89	47.34
5	45.79	46.39	47.16
6	46.63	45.77	46.37
7	47.22	47.14	46.52

BLOCK # 018A0303 Sample ID: IN226931

